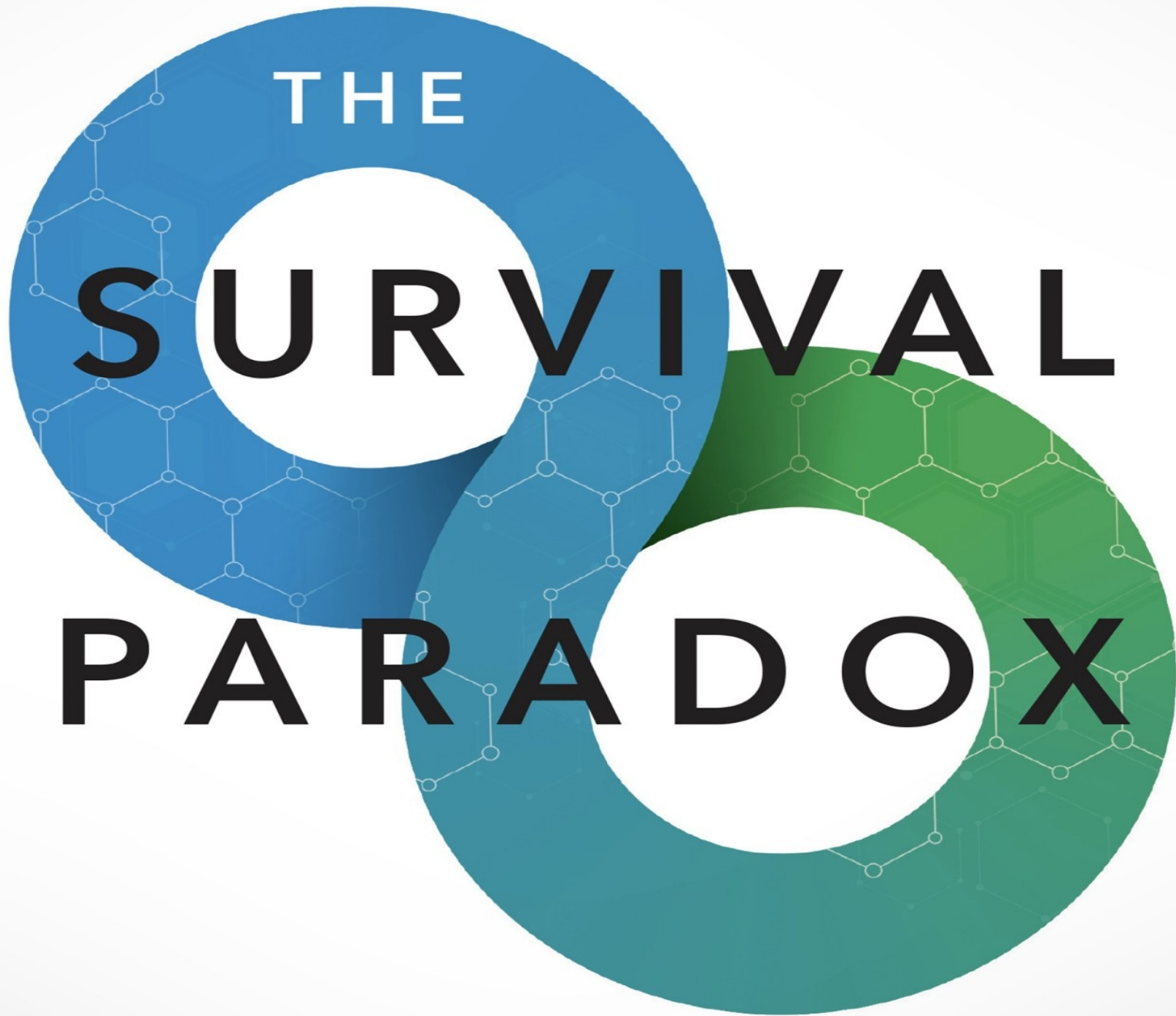
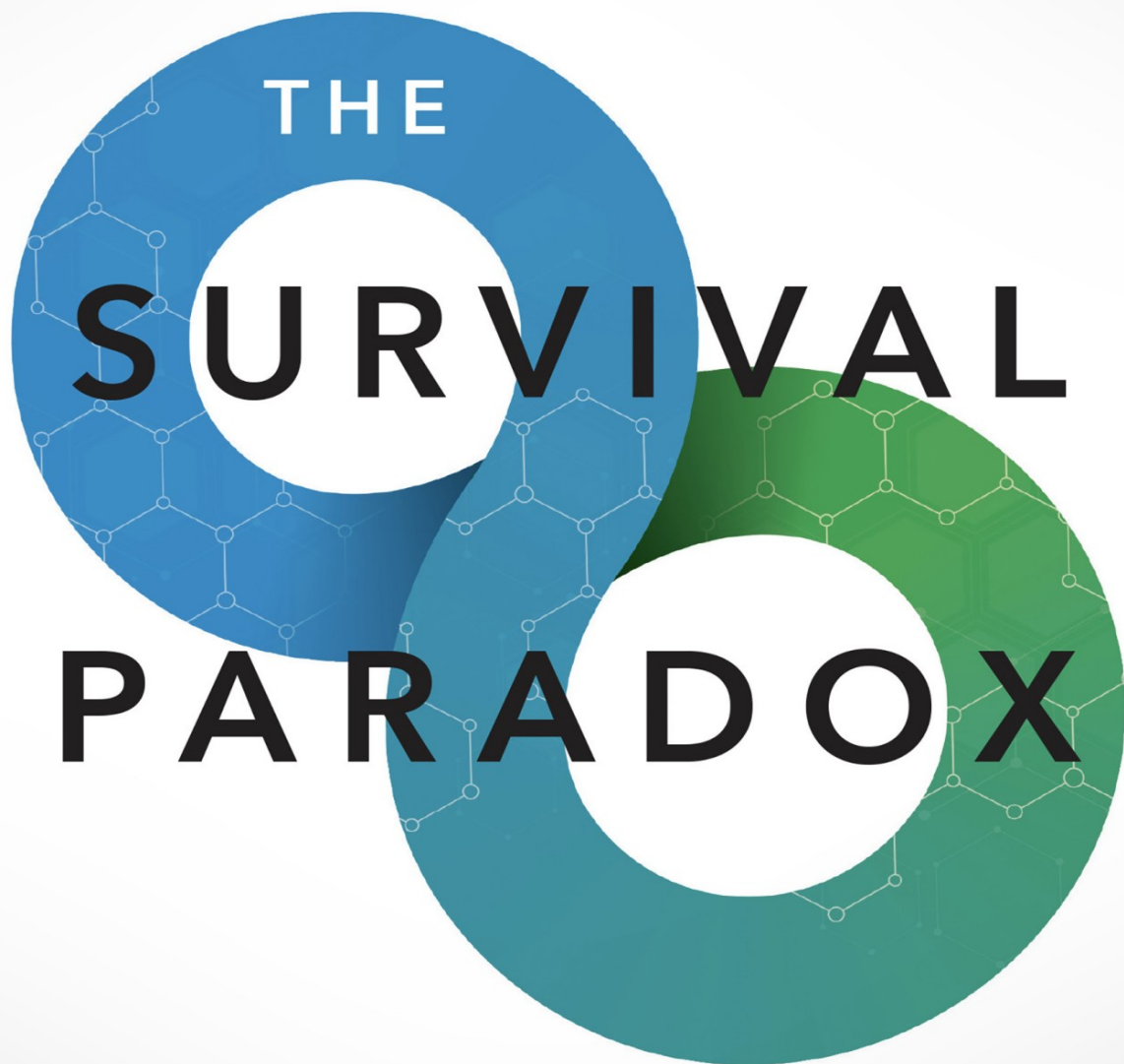


ISAAC ELIAZ, MD



REVERSING
the HIDDEN CAUSE *of* AGING
and CHRONIC DISEASE

ISAAC ELIAZ, MD



REVERSING
the HIDDEN CAUSE *of* AGING
and CHRONIC DISEASE



CONTENTS

Foreword

Introduction

PART ONE

HOW THE SURVIVAL RESPONSE AFFECTS OUR HEALTH

Chapter One

WHAT IS THE SURVIVAL PARADOX?

Chapter Two

THE ARCHITECT OF THE SURVIVAL RESPONSE: GALECTIN-3

Chapter Three

EFFECTS OF THE SURVIVAL RESPONSE

Chapter Four

HOW THE SURVIVAL RESPONSE OPERATES

Chapter Five

A GIFT FROM NATURE: MODIFIED CITRUS PECTIN

Chapter Six

THE HEART OF TRUE SURVIVAL

PART TWO

A CLOSER LOOK AT THE SURVIVAL RESPONSE'S ROLE IN MAJOR CONDITIONS

Chapter Seven

CANCER

Chapter Eight

HEART AND KIDNEY DISEASES

Chapter Nine

LIVER AND LUNG DISEASES

Chapter Ten

METABOLIC ISSUES

Chapter Eleven

NEURODEGENERATIVE DISEASES

Chapter Twelve

IMBALANCES OF THE IMMUNE SYSTEM

Chapter Thirteen

IMBALANCE OF THE MICROBIOME

PART THREE

BREAKING FREE FROM THE SURVIVAL PARADOX

Chapter Fourteen

DETOXIFICATION AND LETTING GO

Chapter Fifteen

ADDRESSING THE SCARS OF SURVIVAL

Chapter Sixteen

TRANSCENDING THE SURVIVAL PARADOX

Conclusion

[Appendix A](#)

[Modified Citrus Pectin Dosages and Galectin-3 Testing](#)

[Appendix B](#)

[Other Ingredients and Compounds](#)

[Appendix C](#)

[Diets](#)

[Appendix D](#)

[Therapeutic Guidelines for Major Conditions](#)

[Appendix E](#)

[Cleansing and Detox Protocols](#)

[Appendix F](#)

[Radiation Exposure](#)

[Acknowledgments](#)

[About the Author](#)

ADVANCE PRAISE

The Survival Paradox is an excellent guide for anyone struggling with chronic illness. Read it carefully and start your journey to wholeness and well-being.

—Deepak Chopra, MD

A true pioneer and leading voice in integrative medicine, Dr. Eliaz presents a profound yet practical model of healing through fascinating research and inspirational patient stories. The Survival Paradox is a much-needed paradigm shift that offers life-changing inspiration and guidance for deep, transformative healing on all levels. A must-read!

—Josh Axe, DNM, DC, CNS, Co-Founder of Ancient Nutrition and Founder of DrAxe.com and Leaders.com

A true scientist, creative thinker, and healer, Dr. Eliaz has made a unique contribution to our health and healing. In The Survival Paradox, Dr. Eliaz weaves a brilliant and beautiful tapestry of the intricate and miraculous workings of the body, mind, and heart. He delves into both science and spirituality, inspiring and transforming the reader while educating about his crucial discovery of the “survival paradox”—namely, that our survival imperative contains the seeds of our own destruction! How and why it happens, and what we can do to detect and then remedy it, unfolds through fascinating personal and professional stories.

You can't help but be inspired by his artful and heartfelt words: “When we open our heart to ourselves and to others . . . the healing power of love and compassion enters. When that happens, we can live longer because we truly heal ourselves, and as a result, we heal our illnesses.”

—Hyla Cass, MD, speaker, bestselling author, integrative health expert, and co-author of *8 Weeks to Vibrant Health*

Dr. Isaac Eliaz has unique insights on the cause and treatment of multiple diseases. His expansive training and expertise as a physician, scientist, and

integrative medicine practitioner allow him to approach health and disease from a systems-based, complex perspective, resulting in him being a true healer. Dr. Eliaz's evidence-based, scientifically sound approach presents a cutting-edge model that he has been refining for more than thirty years. The Survival Paradox provides us access to Dr. Eliaz's wisdom on preventing and treating diseases. Eloquently weaving personal experience, patient stories, and science, this book will transform lives as it contains a multitude of actionable recommendations to reverse and prevent multiple diseases.

—Lorenzo Cohen, PhD, Professor and Director of the Integrative Medicine Program at MD Anderson Cancer Center and co-author of *Anticancer Living: Transform Your Life and Health with the Mix of Six*

Can one molecule really do all that? Even a peep inside this book will shock you with the power hold that galectin-3 has on human physiology.

The most innate sense of any living entity is the notion of survival. That said, survival comes at a cost. Regarding our physiological response to stressors, this cost is the inflammatory response, which, when left unchecked, can lead to tissue degeneration and chronic disease.

Dr. Eliaz does here what no other physician, author, presenter, or fellow human has done in the past: recognize, define, and demonstrate the survival paradox—this new conceptualization of the critical balance between “enough and too much.”

This unique work is a gift to the reader and guides them to understand hidden stressors and how neutralization of galectin-3 can stabilize the survival response to address modern-day maladies that affect humans globally.

—Dan Rubin, ND, FBNAO, Co-Founder of Naturopathic Specialists, LLC

We live in a time of widespread chronic illness, degenerative disease, and unhealthy aging. In this breakthrough book, Dr. Eliaz reveals a new concept called the “survival paradox.” It will shift your understanding of the root causes of health and disease. It will give you insight into the process behind

common problems such as heart disease, diabetes, lung disease, and cancer. And more importantly, it will reveal a method to successfully stop the damaging effects of an uncontrolled survival response. He does this through telling inspirational stories, sharing personal experiences and knowledge, and presenting information in a way that is easy to grasp. This is not another step-by-step “how to reverse aging” manual. Rather, it provides a truly holistic, complete, and multidimensional perspective on health, disease, and healing. This book is more than worth your time and can be life-changing! I highly recommend it.

—Roger Billica, MD, FAAFP, former Chief of Medical Operations for NASA and Founder of Tri-Life Health Center for Integrative Medicine

This book is powerful medicine. In this breakthrough work, noted scientist and clinician Dr. Isaac Eliaz will guide you on a journey of healing and discovery. You’ll learn how, scientifically, you can create the resonance that leads to optimal health. A word of caution: after finishing The Survival Paradox, you will forever view well-being through an entirely new paradigm.

—Peter Bongiorno, ND, LAc, author of *Put Anxiety Behind You*

Thanks to Dr. Isaac Eliaz, I have been following the galectin-3 story in my medical practice for more than twenty-five years. The Survival Paradox will introduce you to this revolutionary, little-known molecule that should become a household term for anyone seeking to prevent or reverse aging and chronic disease. A true pioneer, Dr. Eliaz now provides his life’s personal experiences and clinical research in writing so we can all greatly benefit. His fresh insights will provide you with tips and tools to accelerate healing. Thoughtful and provocative, The Survival Paradox should be read by all seeking a better and healthier life. Certainly, a book ahead of its time!

—Allan Magaziner, DO, Founder of the Magaziner Center for Wellness and past President of the American College for Advancement in Medicine (ACAM)

Isaac Eliaz presents a genuine message of hope for sufferers of chronic

complex illness. He adroitly bridges Eastern and Western paradigms of healing and invites the reader to dance among these systems with him. He connects disparate organ systems in a way that maps the interrelationships of our components that define us as an organism. He illustrates how the macro and the micro are driven by the same processes. The cell, the body, the social community, the planet, and beyond are essentially one and the same, with similar rules and foundational truths applicable to all. Not only is Isaac an incredibly gifted physician who has helped countless patients, but he has also provided the medical community with so many practical tools that I can attest have made a meaningful impact in my own practice and in so many others.

—Steven Harris, MD

There are doctors, and there are healers. Dr. Isaac Eliaz is both. From the opening pages of The Survival Paradox to the end, the reader is guided through an engaging experience. Dr. Eliaz weaves together the latest science with timeless body-mind-spirit wisdom. The result is a compelling journey that inspires, informs, and transforms. No matter where you are with your health, you'll find valuable, actionable insights in his powerful synthesis.

—Mark J. Tager, MD, CEO of ChangeWell and co-author of *Enhance Your Presence: The Path to Personal Power, Professional Influence & Business Results*

This book is brilliant! It contains a wealth of information drawn from Dr. Eliaz's decades of medical research and clinical practice—boiled down perfectly to provide practical application to daily life with the power to overcome your chronic health challenges while healing your mind, body, and soul. Dr. Eliaz's wisdom, compassion, and understanding shine through.

—Myriah Hinchey, ND, Medical Director of Tao Vitality, LLC

In today's toxic and chaotic world, mankind's survival as a species may be in question, but even more importantly, his survival as a spiritual being is at risk. Dr. Isaac Eliaz has expertise in both of these realms, and this book brings

them together, presenting a profound paradigm shift in how we view health and disease. Few MDs share his background of high-level biochemistry and botanical research, with multiple publications in peer review journals and recognized expertise in integrative medicine and clinical practice. This book contains his distilled knowledge and gives you understanding and practical advice you can apply to help you live a happier and healthier life.

—David Minkoff, MD, Co-Founder of Life Works Wellness Center

ISAAC ELIAZ, MD



REVERSING
the HIDDEN CAUSE *of* AGING
and CHRONIC DISEASE



LIONCREST
PUBLISHING

COPYRIGHT © 2021 ISAAC ELIAZ, MD

All rights reserved.

THE SURVIVAL PARADOX

Reversing the Hidden Cause of Aging and Chronic Disease

ISBN 978-1-5445-1954-8 *Hardcover*

978-1-5445-1952-4 *Paperback*

978-1-5445-1953-1 *Ebook*

The names of individuals have been changed to respect their privacy.

This book is dedicated first and foremost to the three amazing women in my life. To my precious, wise, and beautiful partner in life, Gili, and my wonderful daughters, Lihi and Amity. You have stood by my side through decades of crazy ideas and endeavors with support, patience, and love. You continue to teach me so much about life and love every single day.

To my parents, Ruth and Emanuel Eliaz. You provided me not only with a wonderful childhood but with an opportunity to travel the world and be exposed to multiple cultures and ways of life that ultimately shaped how I think and who I am.

To my four younger siblings: Ari, Rani, Einat, and Yoni. Thank you for inspiring me to find new ways to express my vision for healing.

This book is also dedicated to my precious Buddhist teachers in Asia and the United States, who trusted me and had faith in me to share their ancient knowledge and heart wisdom, and to guide me on my meditation path.

And lastly, it is dedicated to all of my patients, who've touched the depths of my heart and taught me so much. You've taught me about life, death, our limitations as human beings, and my role as a doctor and healer. And most importantly, you've taught me about the infinite healing power and capacity that is innate in each one of us.

To my readers, it is my heartfelt hope that this book will offer a glimpse, a door, and a guide to shift from surviving to thriving—from struggling and fighting to love, compassion, and healing.

FOREWORD

By Jason Rezaian

Global Opinions Writer for the *Washington Post* and author of *Prisoner: My 544 Days in an Iranian Prison*

When I began receiving treatment from Isaac in 1994, I had no idea how essential he and his philosophy would become in my life. In the summer of 2014, after working as a foreign correspondent in Tehran, Iran, for five years, my wife, also a journalist, and I were arrested in our home and taken to one of the world's most notorious prisons. We were immediately separated and thrown into solitary confinement. I spent forty-nine days in isolation in a cell that measured eight and a half by four and a half feet. My wife endured seventy-two days like that before being released on house arrest. I spent a year and a half in that prison.

I realized in the very early days that resistance and the urge to fight my circumstances wouldn't solve my problems—and in all probability would make them worse. Survival is important, but it doesn't come through struggle. I learned this from Isaac.

When I began seeing Dr. Eliaz as a senior in high school, his office was less than a mile from my family home in Northern California. He moved his practice several times after that, but like so many under his care, I was willing to travel for the benefit of the treatment he offers. His care has been a constant in my life. Even after moving to Tehran, I saw Isaac on my

annual trips home. Some years, I was in better shape than others. Those checkups—when he did extensive blood work, gave me acupuncture, helped me detox, and most importantly, heard my concerns and desires, and then offered a course of action—always got me back on track.

During the early weeks of my imprisonment in Iran, I was starved and deprived of sleep. The conditions I was subjected to were designed to torment. My health suffered because of it. I lost forty pounds in the first forty days; I developed a series of infections, severe anxiety, and depression; and I was denied medical attention until many months into my ordeal.

But the understanding that these circumstances would inevitably come to an end—something that Isaac taught me long ago—gave me hope. As did maintaining a sense of humor. I made a commitment to find something to laugh about every day.

I knew that getting through an experience in which I had very little control over my circumstances would require focusing on the very few variables that were mine to control and use them to my advantage. With fewer stimulants and distractions, I allowed myself to slow down. I read, I found things to laugh at, and I practiced compassion and empathy for others—including for my captors—but just as importantly for myself.

And I exercised.

In solitary, I walked the length of my cell thousands of times every day. When I was put into a cell with a walled yard connected to it, I busied myself doing laps. In thirteen months, I walked the length of the United States and then some. I realized that staying in motion was not only restorative for my muscles that had atrophied in solitary, but also allowed me to feel I was alive. These were lessons I learned from my years of receiving treatment and healing from Isaac.

As the months dragged on, I was allowed more contact with the outside world. I learned that Isaac had been in constant contact with my mother, who was able to visit me periodically later in my detention. Through her, he passed advice and suggested different ways that I might get relief from some of the symptoms that ailed me. That connection helped me get through those difficult days, knowing that, although the people that cared about me most were far away, I wasn't alone.

In January of 2016, I was finally released from prison and returned to the US as part of a high-profile diplomatic settlement with Iran. It was big news, and there was a lot of attention directed at me, which I was in no position to navigate physically and spiritually.

As I had so many times before, I sought healing from Isaac.

His unique approach to addressing the needs of the mind, body, and spirit with science and self-care had helped me weather a lifetime of injuries. But mending broken bones and broken hearts is one thing. When I returned home from that ordeal, I worried I was a broken person.

Over the years, Isaac helped get my blood pressure under control, helped me process the loss of loved ones, and guided me through heartbreak (more than once). Seeking his care in the long road to recovery after my unexpected and incomparable ordeal of being held hostage was the most natural thing for me to do.

After a few hours under his care—continuing on this lifelong path that we started together more than two decades earlier—I began to feel, bit by bit, like myself again. Over the next few weeks, I visited Isaac regularly. My life began to return to something like normal, although I knew there were lingering scars from the trauma: not visible ones but internal ones that were affecting my physical and psychological well-being.

Being treated by Isaac has been the cornerstone of my healthcare since I started going to him, and through those experiences, I knew I would come out of this one stronger. Thankfully, that's exactly what's happened.

Four generations of family have benefitted from his care. My grandmother—a former small-town doctor whose medical philosophy was guided by deep empathy and a holistic approach (before such a term existed)—went to Isaac in her final years as she grappled with illness and her own mortality. My father, a rug merchant from Iran, got care from Isaac following cancer and diabetes diagnoses. And although he is not an OBGYN, Isaac's daily consultations with my wife and me during the third trimester of a not-so-easy pregnancy were tremendously influential in guiding us toward the healthy and happy birth of our first child. A baby boy.

My life isn't perfect. But I can say that after a journey filled with traumatic experiences—not more or less than anyone else but perhaps with some extremes—the lessons and healing I've received from Dr. Isaac Eliaz have taught me to safeguard my own health and have dramatically altered my life for the better by shifting my experience of caring for my body and spirit. In this important book, Isaac will help you discover how to do that too.

INTRODUCTION

We live in a time when groundbreaking medical advancements are radically improving health and longevity. Yet, despite these astounding achievements, more of us are affected by chronic diseases than ever before. Statistics paint a dire picture: we may be living longer than generations past, but our collective health continues to decline under the weight of complex, degenerative conditions. Even in the absence of diagnosed illness, many of us wake in the morning to chronic pain, anxiety, or depression.

We tend to accept this decline in health as part of the normal aging process—but it doesn't have to be.

When we take a step back and consider *why* these conditions appear and where they come from, we see that they are a result of our bodies' physical responses and emotional reactions to the world around us. In turn, those responses and reactions are all driven by a singular, fundamental need: survival. Humans are designed to survive. Our bodies have literally been built for it.

As we evolved, we developed complex protective mechanisms as part of a natural response to the need for self-preservation—the need to survive. If we had evolved in a perpetually relaxed and safe environment, these survival mechanisms would not have developed! But of course, that was not the case. Instead, we have been shaped by external and internal stressors, whether physical, emotional, mental, or psychospiritual.

Although we can thank our survival response for making sure our species

is still on the planet, such durability comes at a cost. For example, we are all aware of our most famous survival mechanism: the fight-or-flight response to danger. But many of us have not yet considered the cascading effects of such a response. How does our body get the energy to launch it? After the danger has passed, where do the chemicals and proteins we created go? All survival mechanisms take a toll.

Let's think metaphorically for a moment. Imagine what happens in daily life when a crisis arises. Perhaps a client threatens to walk away from a deal, or your child breaks an arm, or the pipes burst in your bathroom. Suddenly, everything else in life is pushed to the side while you focus all time and energy on the crisis. You're unable to pick up new clients while dedicating yourself to the unhappy one; or because you spend all evening in the emergency room with your child, you eat fast food and don't sleep all night; or you spend twice as much money fixing the faulty pipes since you now need a rush job. The response to any crisis results in these kinds of casualties.

You already understand how the survival response works because you live it in your daily life! What you might not know is that similar crises and resulting casualties play out at the molecular level and have been since we were born and, indeed, since the origin of our species. Our bodies are not just trained to survive but to survive *at any cost*. Now imagine what happens when our environment and the pace of our lives create a situation in which our survival responses never turn off. Some of these inherent protective mechanisms are actually causing irreversible long-term damage to our health.

Further, when faced with a life-threatening illness, our innate survival response can even be fundamentally at odds with our ability to heal—it can

literally create the kind of microenvironments where disease and cancer thrive. In an attempt to survive a stressor, our survival response may cause more damage than the stressor itself.

This is the survival paradox.

The question is, how do we determine which self-preservation responses are healthy and necessary for growth and development, and which ones are causing irreversible long-term damage? How can we transform our innate survival drive to work *for* us and promote healing, wholeness, and longevity rather than *against* us, causing suffering, isolation, disease, and premature death?

I have spent much of my life working to unravel this mystery, searching for the true source of our innate healing abilities.

MY LIFE'S WORK

For the last three decades, through my medical clinic, my two nonprofit organizations, and through collaboration with leading academic institutions across the globe, I've researched and treated cancer and complex diseases using integrative medicine—the synergistic combination of Western medical treatments and complementary therapies drawn from different systems. The fundamental intention of this holistic approach is to open more doors for recovery, transformation, and healing so that patients emerge with greater strength, vitality, and a more profound and satisfying experience of life itself. While considering the whole picture in both disease and healing, my research kept bringing me back to the survival paradox, what drives it, and how we do or don't recover from it.

I've been trained in diverse systems including Western allopathic medicine, traditional Chinese medicine, acupuncture, and others. I've

extensively studied and practiced Buddhist meditation and mind-body healing methods, Western and Eastern herbal pharmacopeia, and served as the personal physician to renowned Buddhist masters all over the world. Collaborating with academic institutions and coauthoring peer-reviewed studies is as important in my training as the time I've spent with monks in remote mountains.

The integration of these studies and experiences has allowed me to develop a truly holistic, multidimensional perspective on health, disease, and healing. Above all, I have learned to let go of the expectations and dogmatic paradigms of our current medical systems, conventional and alternative. People often say I think “outside the box,” to which I respond that there was never a box to begin with. There was just the perception of one.

WHAT YOU'LL LEARN IN THIS BOOK

Foundational to holistic mind-body healing is education. I am committed to empowering patients, practitioners, and anyone seeking guidance about lasting wellness. This book is the account of *how* we survive on a biochemical, physiological, and psychospiritual level—and what it means for health, disease, longevity, and quality of life. Through this lens, magnified with cutting-edge scientific data from the most exciting medical fields today, this book offers profound insights for overcoming illness and optimizing health.

- In Part 1 of our journey, you'll receive an in-depth introduction to the survival paradox and, along with it, a paradigm shift in your understanding of the root causes of health and disease. We can master our biochemistry. And it may be simpler than we think! As

you'll learn, scientists have not only identified the one "master protein" responsible for most of the survival response's damage, but have also discovered a way to stop it.

- In Part 2, you'll come to understand the effects of the survival paradox in specific conditions, such as heart disease, lung disease, and cancer. Every organ responds differently to the survival paradox. You'll also learn how to address these conditions based on insights from a variety of medical systems. (While you won't need to fully grasp all of the biological concepts in order to start transforming your health, I have provided as much context as possible. Again, the more you understand, the better equipped you will be for healing.) Think of Part 2 as your micro roadmap.
- In Part 3 you'll develop your macro roadmap. Here, you'll learn holistic methods for transforming the survival response, releasing unhealthy fixation, and shifting from struggle to harmony.
- Woven between the science and advice are a collection of anecdotes, real-life patient stories from my thirty-plus years as a physician in the field of integrative medicine. They are stories of healing, radical recovery, and loss, and of community and courage. It's my hope that these stories give you inspiration, insight, and a new perspective for overcoming challenges, no matter how great or small.
- Throughout it all, I will return to the overarching concept and argument that what happens at the cellular level also happens at the individual, community, global, and even universal levels. Buddhism teaches that everything in the universe is connected. We see that this is true when we map cellular behavior beside community

behavior and find the same mechanisms at work. When we learn to heal our bodies, our relationships with each other, or our connection to the earth, we *simultaneously* learn to heal at all other levels.

I would like to clarify that this is not a how-to book. I won't tell you, "How to Reverse Aging and Disease in Ten Easy Steps." Such lists can be a helpful way to start, but they are rarely transformative because they are antithetical to true, holistic mind-body healing. Rather, within these pages, you will explore a much deeper cause of illness and aging and what to do about it on all levels. You will be able to answer the key question of what it means to truly heal, and how we may cultivate this innate capacity to the fullest.

Altogether, the book comprises an even bigger story, a narrative of the primordial root of our existence. We are built to survive. But how you survive—whether at all costs or minimal costs—is up to you. Once you know the narrative, you can become the author of your own story.

That's what I did.

The insights in this book are the result of my personal exploration. Throughout my life, while I have rejoiced in my successes, I have also learned much from my failures. Specific challenging moments in my life allowed me to experience the survival response and survival paradox at its fullest, and I had to make a choice. Would I get caught in a loop of struggle and reactivity that is ultimately damaging? Or would I take the opportunity to use the crisis for transformation and growth? Amidst the difficulties, life provided me with an opportunity to find a greater depth in my heart. I decided to free myself from the survival paradox's binding consequences. It is from this transformative place that I am sharing this book with you.

FORGING A NEW PATH

Today, we're at a crossroads. The direction we choose will have far-reaching implications on our individual health, our communities, our societies, and our planet. Our body makes trillions of such choices each second, thanks to our vast, intricate network of biochemical pathways. Everything is changing all of the time. We have choices in that process. That means anything is possible!

Over the years, my patients have given me the gift of supporting them during their most vulnerable times, opening up their lives and putting their trust in me. Through my experiences with them, I have come to believe that there is always a pathway for healing because we have choices. And if we do not see a path, *we forge one*.

That is what this book can help you do. Yes, we live in a time rife with chronic disease. But it is also a time when advances in medical research have helped scientists produce a roadmap that we can use to harness both our genetic capacity and our cellular pathways to promote health and alleviate disease at the molecular level.

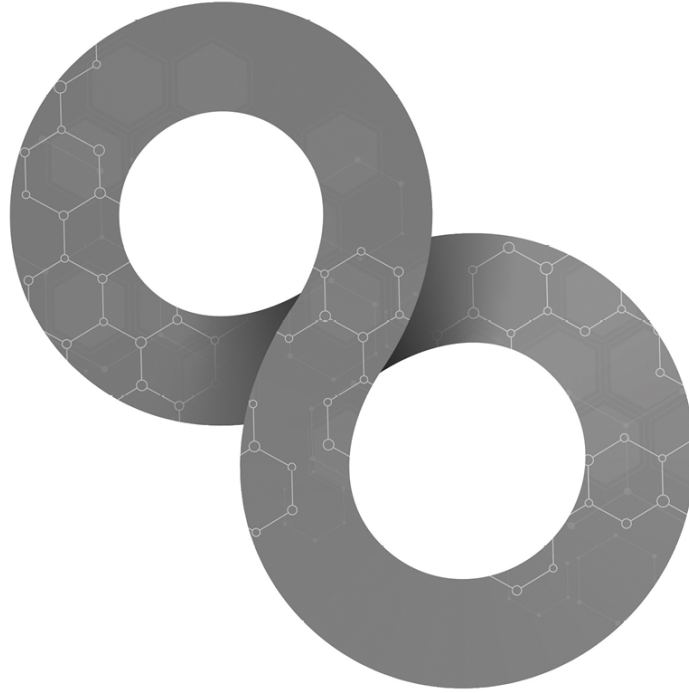
However, there is one thing to remember about navigating a course to recovery, or to any other destination for that matter: a map is only a representation or a rendering—it's not the actual terrain. We all have a unique personal history that creates distinct pathways through which we express our biology, psychology, and the essence of our hearts, which means no two maps will be the same. But when you combine what we've learned from the growing body of scientific research with your own inner exploration and the unfolding of your personal story, a more specific picture will start to emerge.

And with it, much greater healing potential.

Rather than merely providing generic templates of well-known interventions, my intent is to offer you a multidimensional view of how it's possible to uncover your greatest healing potential and start to map your own unique healing path. No one else can improve your health for you. Only *you* can decide what to do based on your unique story: your current state of health, environment, lifestyle, abilities, and goals. What drives you not just to survive but to *thrive* in a state of health and harmony? If you don't yet know the answer to that question, you'll find motivation in the pages of this book.

Understanding the full picture is especially important because medical research and findings are always changing. In truth, of course, everything is always changing. It's the only absolute certainty you can count on. The key is to use this constant change to your advantage. And when you harness the incredible power of change, true miracles begin to happen. Forging your own path to healing is a series of choices. You always have choices. Your first is to turn the page.

PART ONE



HOW THE SURVIVAL RESPONSE AFFECTS OUR HEALTH

CHAPTER ONE

WHAT IS THE SURVIVAL PARADOX?

Rebecca first came to see me at Amitabha Medical Clinic in 2011. She was seventy, with stage 4 lung cancer that had metastasized to her bones. She had no family and lived alone; her companion that day was a stone-faced chauffeur waiting in a car outside the clinic. With tears in her eyes, she told me she had just been diagnosed. Hands shaking, she showed me the PET scan report highlighting the multiple tumors throughout her body. Based on what the oncologist said, she understood that her life could come to an end very soon.

“I don’t want to die,” she said. “I’m not ready to go.” Every cell in her body was reeling with anxiety and fear. Her restlessness was palpable in the air.

As an integrative physician who treats cancer, I’d had this conversation many times. I handed her a tissue and she wiped her tears. “I will do anything I can to overcome this cancer,” she said firmly. I acknowledged her fierce determination, her resolve. After all, determination is what’s needed first and foremost to overcome a deadly disease, right?

With her anxiety so palpable, I wondered how this fear must be affecting her. Not just on the level of her emotions or quality of life; I wondered how it was affecting the cancer cells. Will this fear-based determination not to

die help her overcome her disease? Or will it cause her to become sicker and shorten her life? Her anxiety was so prominent that it infused her surroundings, affecting her ability to take a deep breath. It was constant suffering, and it was clear she was in “survival mode.”

Being in survival mode meant that her sympathetic nervous system hormones, the drivers of her innate biochemical response patterns, were dialed all the way up. Her adrenaline, noradrenaline, and cortisol were elevated, and her insulin was spiking. Her immune response was being suppressed, and her metabolic function was altered. Ultimately, it meant that many of the compounds she excreted in an effort to survive would very likely nourish her cancer and allow it to grow and survive as well.

Survival mode is often a state of stress and panic. The body feels rushed and doesn't slow down, and all cells, whether normal or cancerous, fight harder to survive. Thus, Rebecca's anxiety and fear of dying could “feed” the cancerous cells. Her best chance at beating the cancer and living a longer life was to shift away from survival mode and move into a state of greater relaxation, with less reactivity on the cellular, emotional, and psychological levels.

Based on research and my years of work with patients, one thing has become clear: when facing a life-threatening or debilitating illness, the natural biochemical stress response, our innate fight-or-flight mechanisms that are driven by our instinct to survive are fundamentally at odds with our ability to heal and thrive. This survival drive, rooted in our sympathetic nervous system and expressed by our biochemical alert system, is not going to save us. In fact, it can harm us.

How does this physiological response system turn against us so dramatically, fueling disease processes and premature aging? And more

importantly, what can we do about it?

The good news is, we can do a lot. And we can do it in a way that is actually simpler than anyone facing a complex health condition—patient or provider—might have imagined.

We'll continue to discuss the details of Rebecca's treatment and outcomes in the next chapter. I witnessed something incredible in her case, as well as in many others. Something that Bruce Lipton, Deepak Chopra, and many others have written about, and what the yogis and mystics have been saying for millennia: the mind can influence the body to heal spontaneously and completely. The mind can deliver the body from the brink of death and disease to vitality and longevity.

THE CATCH-22 OF "POSITIVE THINKING"

Published evidence on the mind-body connection is significant and growing rapidly, and based on my personal and clinical experience, the results can be exponential.¹ Its power is within us all the time, and it's absolutely available for us to use.

So, why doesn't it always work?

If mind-body medicine is the clinically studied gold standard "alternative" deemed the safest and most beneficial treatment and increasingly adopted and applied in clinical settings around the world, it stands to reason that many more people would be able to meditate or "positively think" their disease into remission.

It's the ultimate catch-22: when someone is facing a life-threatening disease, asking them to relax, change their thought patterns, and focus on happy, healing energy is much easier said than done. It's like asking

someone whose house is on fire to stay calm, think positively, and deeply inhale the smoke from their burning home.

We're built for survival. We don't just want but intrinsically *need* to overcome disease and to heal. I've come to find, based on extensive published research and years of clinical observation, that this survival drive is the one major blockage standing in the way of would-be successes.

In an era when we tend to look for quick fixes and symptom suppressors, we're really just suppressing our healing capacity. We don't take the time to stop, slow down, and look within. The idea that we don't have time—that we must rush, and must compete with everyone, including ourselves—is detrimental to our health and well-being.

What Rebecca needed above all else was to slow this sympathetic nervous system response, but she couldn't. Her house was burning down, and she couldn't take a deep breath in the midst of what appeared to be a life-threatening situation.

When we experience a sense of restlessness, not feeling safe, or not trusting our environment and community, it can translate all the way down to the cellular level. When we feel unsafe and believe we need to survive on our own, it changes the metabolism and function of our cells—they receive signals from their environment that there is a lack of oxygen. The formal term for lack of oxygen is *hypoxia*, and the hypoxic cell can't breathe or naturally relax. (In cancer however, the cells behave this way even in the presence of oxygen, which we'll discuss in detail later in the book.)

To begin the healing process, we need to move a hypoxic cell to a place where it feels it can breathe, create a normal metabolism, and return to normal mitochondrial function. To do this, the cell and the person must shift away from a state of survival toward a state of relaxation. To achieve

such a change, the person as a whole must experience safety and balance all the way to the cellular level. The survival alarm has to be turned off!

So, how did Rebecca and I begin addressing her cancer? How was she able to take a deep breath? We worked directly on her biochemistry. We didn't just circumvent her fear and anxiety—we *transformed* it. We used certain natural compounds to quiet the alarm system, normalize the cell, and fight the cancer. We combined those compounds with meditation, breathing exercises, regular acupuncture, and healing sessions with different modalities, including hands-on osteopathic, craniosacral, sound, and visualization therapies. Most importantly, we surrounded her with unconditional love and affection, a sense of community, and an environment that held her without judgment—we created a world where she felt safe and loved.

A DEEPER HEART-BODY CONNECTION

The mind-body connection is amazing, and it's not a one-way street. Emotions, thoughts, and subconscious responses clearly affect our biochemistry, our physiology, and our subjective and objective experiences of health and disease. At the same time, our biochemistry sharply affects our emotions and our thoughts. It affects who we are at the core.²

Meditation and other mind-body practices can undoubtedly give us the quantum edge in healing. They work not only because they can calm our anxiety, reduce inflammation, and reverse our biochemical disease processes—they also work because they melt our rigidity and relax our fixations. They dissolve the literal boundaries between the person and the disease, allowing the person to reach and engage the tumor, the atherosclerotic plaque, the burrowing Lyme spirochete, or any other

opportunistic infection.

However, mind-body methods like meditation can only unleash our innate healing potential when we figure out how to truly engage our hearts. In this regard, a more accurate term for this type of healing is “heart-body medicine” rather than “mind-body medicine.” It is *heartfulness* rather than mindfulness. I call this “open heart medicine.”

The basic physiology of our heart and the fundamental mechanics of this vital organ function in a way that actually allows and supports “miracle” healing—an unexpected positive outcome that defies probability.

Ultimately, we have to get through the thin veneer of “positive thinking” and penetrate the deeper layers of our defenses. Our instinctual fears and anxieties, while part of our innate survival drive, obstruct our healing capacity by triggering biochemical changes in our body that create *literal physical barriers*. These barriers are made of different components that need to be treated. For example, there can be hyperviscosity, which is thickness of the blood that hampers circulation and the ability to deliver oxygen to the tissue; *fibrosis*, which is the scarring or hardening of tissues and organs; biofilm structures, which form protective shields around tumors and pathogens; and more. And all of this will translate into changes in communications between the cell and its environment. This causes changes inside the cells and affects their function.

So, what is the key to shifting us from survival to harmony? From disease to longevity? What is this metabolic survival alarm that must be turned off?

Researchers have identified one master protein produced by the body, which is at the headwaters of our biochemical alarm system. This protein dictates our biochemical and physiological response to stress, illness, and injury.

The more stress we're under, the more our bodies will view life as a battle, leading to ongoing conflict and friction within. Production of this survival protein will ramp up in an effort to resolve the conflicting dialogue between the body and the outside world and between different systems and cells within the body. Here is where we can see the paradox of this survival protein in action.

The molecular end result of this reactive defense strategy is contraction, isolation, and often disease. These are survival responses, which are driven by self-preservation but unfortunately lead to inflammation and fibrosis. These responses also lead to degeneration at the cellular level, organ system level, and at the level of our well-being and longevity. They halt the cooperation between our trillions of cells that would otherwise seamlessly communicate with each other in the miracle of life. The body has an innate capacity to heal itself—when the survival response doesn't stand in its way.

¹ Heather N. Rasmussen, Michael F. Scheier, and Joel B. Greenhouse, "Optimism and Physical Health: A Meta-Analytic Review," *Annals of Behavioral Medicine* 37, no. 3 (2009): 239–56, <https://doi.org/10.1007/s12160-009-9111-x>.

Kurt Ackerman and Andrea F. DiMartini, *Psychosomatic Medicine* (New York: Oxford University Press, 2015), <https://www.worldcat.org/title/psychosomatic-medicine/oclc/893646776>.

² Cynthia Vieira Sanches Sampaio, Manuela Garcia Lima, and Ana Marice Ladeia, "Meditation, Health and Scientific Investigations: Review of the Literature," *Journal of Religion and Health* 56, no. 2 (2016): 411–27, <https://doi.org/10.1007/s10943-016-0211-1>.

CHAPTER TWO

THE ARCHITECT OF THE SURVIVAL RESPONSE: GALECTIN-3

Now that you know what the survival paradox is, let's meet its molecular architect.

If you've never heard of galectin-3, you aren't alone. Despite the fact that there are thousands of papers published about its role in driving everything from cancer to heart and kidney failure and much more, the vast majority of people—including most healthcare practitioners—have never heard of it either! But you're about to hear a lot about it.

There are different types of galectins, but the most studied (yet little-known) one is galectin-3, a fascinating carbohydrate-binding protein. On close examination, it plays an important role in the balance between health and disease. It is the core component and initiator of our self-preservation mechanism. I call it "the survival protein." Let's define exactly what it is and what it does inside the human body.

THE OPERATION OF GALECTIN-3

When injury, illness, or other stressors occur, our innate survival response triggers the production and activity of galectin-3. In these instances, galectin-3 initiates a cascade of processes that are necessary for injury repair. However if the alarm fails to turn off after the threat subsides,

galectin-3 gets out of control and *can seriously harm us*.

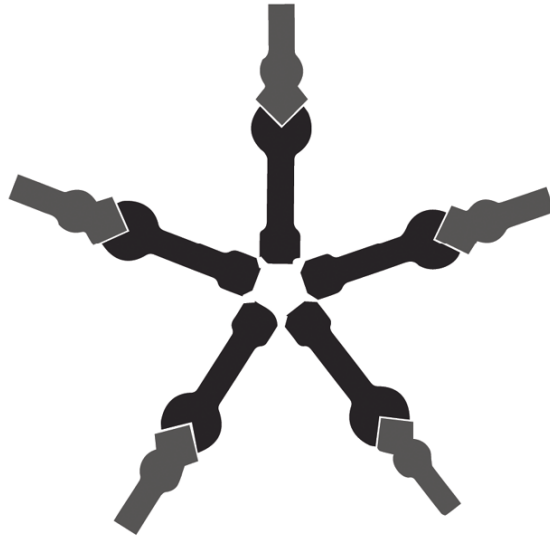
When galectin-3 activity continues uncontrollably, it effectively “goes rogue,” driving inflammation and fibrosis rather than healing. This, in turn, can lead to numerous disease processes. What’s more, pathogens such as different infectious agents and tumors can hijack galectin-3 and use it for their own survival.³ This is a key issue that can be treated strategically, and we’ll further explore this concept throughout the next chapters.

Galectin-3 is produced or *expressed* in different types of cells. In particular, galectin-3 is expressed in immune cells, in epithelial cells (the ones that coat certain tissues such as those of the intestines and lungs), in endothelial cells (the inner-lining cells of the blood vessels), and in sensory neurons, among others.

We understand that galectin-3 can be beneficial or harmful, but how can one protein harm and benefit us at the same time? To gain a better insight into this paradox—our survival paradox—let’s take a journey together into the structure of this protein.

Galectin-3 has a chimera structure, meaning that different structures from various sources come together to create it (a chimeric character you might be familiar with is Frankenstein: he was created from many different parts). When galectin-3 is activated, it can bind to other galectin-3 proteins and other carbohydrates to form complex structures. Up to five individual galectin-3 proteins can stick together, creating five-sided structures called *pentamers*.

Galectin-3 Pentamer



When galectin-3 forms pentamers, these can attach to other galectin-3 pentamers, to other carbohydrates (sugars), and to cell-surface receptors, where these structures can then mediate cell reactions and control the interaction between the cell and the environment. Sounds complicated? It is a bit. But don't worry, we'll break it down.

Our survival protein, galectin-3, is activated when we experience a sudden threat, be it physical, emotional, mental, or psychological. It's also activated in cases of injury, infection, cancer, or other illnesses. When galectin-3 is activated, it turns on multiple pathways that initiate inflammation and the process of fibrosis, and such scar tissue build-up can lead to hardening and dysfunction of tissues and organ systems. Furthermore, it can also overexpress itself in specific areas of the body, for example, in the joints, cardiovascular system, or the brain. And what is truly amazing is that it can exert very different effects at different sites based on what it's bound to.

GALECTIN-3 EXPRESSION IN MODERN LIFE

To better understand the complexity of galectin-3, let's relate it to the bigger picture: our modern-day existence. We live in a world where people continue to become more isolated. When people are less connected to each other and to the earth, all become weaker. We exploit and abuse our natural resources, and we see the effects of rapid climate change. Global warming is an inflammatory process on the planetary level.

At the human level, our internal and external sense of peace is dwindling, and our attention spans are ridiculously short. We can no longer wait for weeks, days, or even hours to give or receive a response—we can only tolerate waiting for milliseconds, and we feel the need to react immediately to every stimulus. Most of us live high-stress lifestyles inundated with electronic and other forms of stimulation. I don't think it's an exaggeration to say that our modern society is in a state of overwhelm.

The continual barrage of stimuli from every direction, the onslaught of environmental toxins, the ongoing mental, physical, and emotional stress we've grown accustomed to—these disturbances throw us into survival mode where our systems are on constant high alert, like an alarm that never turns off.

The result? Unhealthy galectin-3 expression, and with it, progressive damage to vital organs and systems over the long-term. This, in turn, fuels more galectin-3 production, forming a perpetually closed loop system that is proving to be perhaps the single greatest threat to our health and longevity.

The condition of our alarm system and its response to stressors of different origins depends upon the condition of multiple other systems. It's

influenced by the neurological, circulatory, and metabolic systems, as well as mitochondrial function (our energy production system). Our diet and lifestyle affect it too. Regardless of the nature, origin, or location of the stressor, the response—galectin-3—has an extraordinary influence on our body's alert system and, subsequently, our entire spectrum of health and longevity.

For our alarm system to work correctly, our inflammatory, immune, and other biochemical responses must be carefully regulated. When the alarm system is working well, it can resolve slow-coming issues like cancer, aging, or joint pain. It can also ramp up quickly and address immediate threats like cuts, infections, bruises, emotional stress, and other dangers. Then it can wind down just as rapidly after the problem has passed.

Let's compare a healthy inflammatory response to an unhealthy one by thinking about what happens when we turn on lights. Turning on a single switch doesn't take much energy. In this case, "turning on one light" alerts the body of an issue, illuminating the need for repair. When this happens within the body, it's an entirely normal, acute inflammatory response, and when the problem is gone, the light turns off.

However, the trouble begins when a switch is turned on and can't be turned off. It's as though a circuit has malfunctioned. When the switch stays on, it triggers a cascade, causing multiple lights to switch on. This is the start of chronic inflammation, and the body goes into crisis mode. At that point, the body has a choice: resolve the problem or keep turning on more lights. If the body chooses to keep switching on lights, this will eventually lead to a much bigger crisis.

Another problem with these lights is that they can be turned on in isolation, away from the body's radar, meaning the body will be unaware

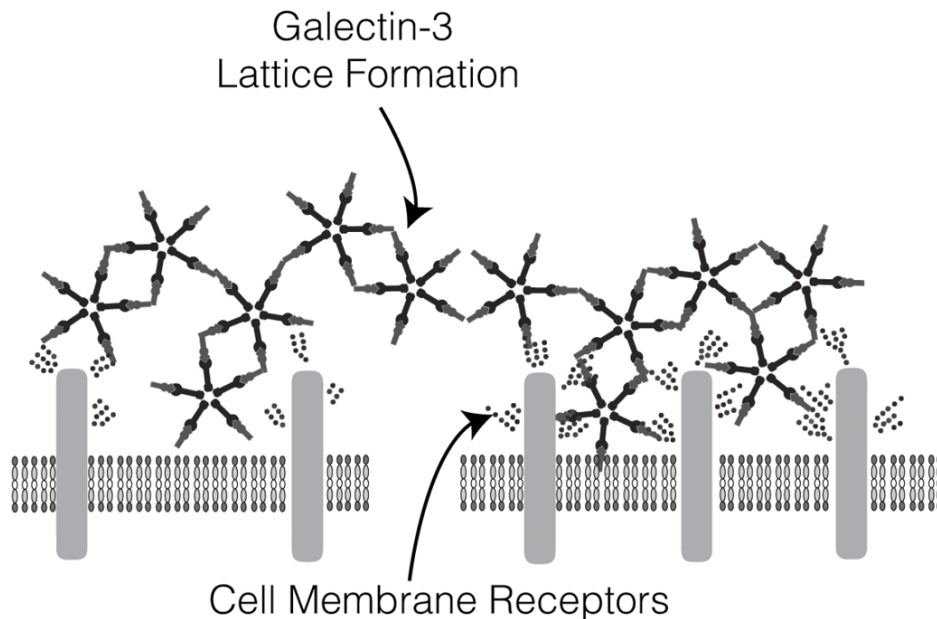
that these lights are even on. Just like these lights, galectin-3 can be activated in an isolated microenvironment where it gradually causes damage. In some cases, by the time the damage is detected, it may be too late to heal or reverse it. A person may wake up one day to discover “sudden” kidney failure, when in fact, the damage occurred slowly over time—they were just unaware of it.

The Risks of Isolation Formations

Isolation is a fundamental survival strategy. It is initiated and driven by galectin-3. As we discussed earlier, galectin-3 uses multiple pentamers bound to each other in different ways to create lattice formations (or coatings or biofilms). These formations create pockets of isolation around areas of damage, infection, and toxic build-up, among others. Within these microenvironments created by galectin-3, diseases can develop undetected and remain protected from drug treatments and other therapeutic agents.

Frequent harmful visitors within the body—like bacteria, viruses, fungi, parasites, other infectious agents, and cancer cells—have a similar isolation strategy. They can hijack galectin-3 to create a shield around themselves (a lattice formation) so they are undetected by the immune system and can even evade therapeutic agents. Galectin-3 can also isolate various threats that are too difficult for the body to deal with, such as toxins and heavy metals.

Galectin-3 Pentamers Form Lattices That Attach to Cell Membrane Receptors



You can imagine that on a psychological level, we go through a similar process, burying emotions and traumas that are too difficult for us to deal with. Even if these traumas are not at the surface of our awareness or consciousness, they can still have a psychological and physiological effect on us. You might have had an experience while going through a detox process where an emotion or memory surfaces all of a sudden. Where was this emotion all this time? It was likely buried in a microenvironment that was not accessible to us. As we open or reveal our physiological microenvironments and release toxins, we can also open psychological microenvironments releasing buried emotions.

Even if an isolated area is not specifically created in order to hide an infectious agent or cancer cell, the microenvironments created by the galectin-3 lattice formations are still walled off from our circulation, and

these altered environments can often become very inflamed and hypoxic due to a lack of oxygen. Hypoxia also shifts our cellular energy production pathway from normal mitochondrial function to *anaerobic glycolysis*, which is a highly inefficient way to produce energy; it results in the buildup of lactic acid and other inflammatory metabolic by-products. This can lead to further hypoxia, which produces additional inflammation and galectin-3 expression, causing the hardening or dysfunction of tissues, organs, and blood vessels.

THE PROS AND CONS OF GALECTIN-3

Despite the potential harm it can do, galectin-3 serves a few important purposes within the body. It helps intranuclear cell development and extracellular injury repair and survival. However, when the body is in crisis and there is an upregulation of galectin-3 production, it can have detrimental consequences.

Due to complex biochemical structures and genetic tendencies within each person, there is no standard, predictable response when it comes to galectin-3. This protein can be at different levels in different people and trigger different responses, even if they have the same condition. For example, some people's bodies are "hypervigilant," always on the alert, and they respond to a stimulus or trigger with overinflammation. Other people may not have a good "survival sense," and they lack the ability to fight and create the proper inflammation. Instead, they have a tendency to shut down and end up with suppressed immunity or an increase in fibrosis.

Furthermore, there is an adaptive response with galectin-3, meaning the reaction is amplified due to previous physical, emotional, or psychological trauma. In an adaptive response, our system has been conditioned to

respond to specific triggers in a particular way. In other words, it repeats the patterns it is accustomed to, all the way to the level of our cellular memory.

Healing without Consequence

For our bodies to heal properly, we often need to remove the stimulants that cause the inflammatory process to perpetually continue. It's no secret that as we get older, it takes more and more effort to do things that once took no effort at all. When we are young and agile, our bodies are more efficient and less toxic; they are flexible and have a high capacity for change, growth, and repair. We can mount a robust inflammatory response to shut a problem down without consequence. Like the metaphor of a bird flying in the sky without leaving any trace, or like writing on water, we can often solve a problem without leaving a trace.

However, as we age, our bodies lose that agility, and we are more apt to carry our issues with us. For example, if an injury occurs to the skin in utero, the wound can heal without a trace, but as we age, the wound healing process slows and causes increased scarring.⁴ As we travel the road of life, our bodies display the evidence of our physical, emotional, psychological, and spiritual traumas—they no longer heal with ease.

The metaphors for a bird flying without leaving a trace and writing on water come from Buddhist philosophy. They serve to illustrate the nature of thoughts and experiences as arising and vanishing—an example of impermanence. This is what inflammation should be: it should be an acute response that occurs and then disappears. It should turn off without a trace and without lingering consequences. This is what happens when we have a robust immune system and when galectin-3 works appropriately. And when it doesn't, the damage begins.

The Solution: Blocking Unhealthy Expression of Galectin-3

I'd like to take a moment to emphasize a critical point and the primary reason I wrote this book: we can absolutely interrupt this cycle of destruction and halt—or even reverse—these fundamental disease processes. How? By deactivating unhealthy galectin-3.

When we block galectin-3 from binding, we can break up lattice formations and reach the isolated pockets and areas of the body, including tumor microenvironments. Abnormal tissues and cells, even tumorous cancer cells, can become normal once again, which, needless to say, has tremendous implications for our health and longevity. By blocking unhealthy galectin-3, we can dismantle its harmful effects and render it inactive, decreasing unhealthy inflammation in the process. This makes blocking galectin-3 one of the most important therapeutic strategies for treating a vast array of conditions.



REBECCA'S STORY (CONTINUED)

Let's revisit Rebecca's story since it helps illustrate how galectin-3 can directly influence survival, health, and disease.

When Rebecca came to see me in 2011, it was the first year we were able to test galectin-3 levels in the blood. Thanks to a simple new serum assay that was recently approved by the FDA and is now readily available, she was one of the very first patients in my practice to have galectin-3 levels

tested.

Rebecca's initial levels were sky high, and the by-products of her sympathetic nervous system response to her crisis were elevated, as well as other proinflammatory, procancerous markers. A key strategy in her treatment plan was to target galectin-3 using various proven methods. We used her levels as a marker to gauge her progress throughout.

The results were unmistakable: when Rebecca was doing well, her galectin-3 levels were lower, and when she was in a crisis, her levels were higher. For Rebecca, this marker served as an important indicator as to when the cancer was aggressive and when it was "quiet." This helped us fine-tune her treatments and stay one step ahead of the cancer. (Note, however, that due to its complex biochemistry, galectin-3 can cause damage even at low levels. It is therefore important to address galectin-3 regardless of its levels. More information can be found in Appendix A.)

Rebecca taught us something very important: she exemplified the intimate connection between our emotions and our health. When Rebecca's anxiety increased, her cancer got worse. Her presentation was so pronounced and immediate that it was easy to see when her anxiety was worsening. But when she was able to relax, quiet the anxiety, and be more spacious, her symptoms got better. The way Rebecca responded as a person was the way her body responded as well. When her survival crisis decreased, and she became comfortable thinking about life, death, and impermanence, it affected the way the cancer functioned. The cancer felt less threatened and decreased its own survival response.

Does it sound new-agey and fluffy when I talk about changes in the behavior of cancer? Really, it's not. I'm referring to changes in the levels of growth factors that drive the aggressiveness of cancer, factors like

downstream proteins that are regulated by our survival protein, galectin-3. Such downstream proteins are impacted by signaling molecules—which themselves are impacted by our emotional state.⁵

Rebecca was able to calm her system through regular meditation, deep breathing, acupuncture, participation in my meditation and healing retreats and workshops, and through the use of galectin-3 blockers. These helped to mitigate the initial survival process and significantly reduce the growth and aggressiveness of her cancer.

Rebecca's cancer did not completely respond to chemo and radiation, but it subsided through these healing methods. Her scans became normal, indicating that her cancer had gone into remission. But Rebecca did more than just incorporate these healing methods into her treatment—she also developed community and friendships with other patients in our center. These friends cheered her on throughout her journey, and the stoic driver who brought her to her first appointment was no longer needed, as she began participating in lively carpools to the clinic. She went from being highly critical of nonconventional approaches and bitter about her diagnosis and fate to embracing her process and welcoming her treatments.

Rebecca's transformations profoundly affected her physiology and allowed her to outlive her prognosis considerably. One day, her laugh rang through the clinic from the IV room, reminding me of the healing power of joy. Her cancer eventually returned, but even with residual lung cancer, she lived seven more years with a better quality of life than she had experienced in decades. She said, "Isaac, I feel alive like never before." She died peacefully in her home, in a meditative state, surrounded by friends. Her life was celebrated by the many people who were deeply touched and inspired by her journey.

³ John L. Caniglia, Swapna Asuthkar, Andrew J. Tsung, Maheedhara R. Guda, and Kiran K. Velpula, “Immunopathology of Galectin-3: an Increasingly Promising Target in COVID-19,” *F1000Research* 9 (2020): 1078, <https://doi.org/10.12688/f1000research.25979.2>.

Mohammad Farhad, Annah S. Rolig, and William L. Redmond, “The Role of Galectin-3 in Modulating Tumor Growth and Immunosuppression within the Tumor Microenvironment,” *OncoImmunology* 7, no. 6 (2018), <https://doi.org/10.1080/2162402x.2018.1434467>.

Juan Garcia-Revilla, Tomas Deierborg, Jose Luis Venero, and Antonio Boza-Serrano, “Hyperinflammation and Fibrosis in Severe COVID-19 Patients: Galectin-3, a Target Molecule to Consider,” *Frontiers in Immunology* 11 (2020), <https://doi.org/10.3389/fimmu.2020.02069>.

⁴ Alessandra L. Moore, Clement D. Marshall, Leandra A. Barnes, Matthew P. Murphy, Ryan C. Ransom, and Michael T. Longaker, “Scarless Wound Healing: Transitioning from Fetal Research to Regenerative Healing,” *Wiley Interdisciplinary Reviews: Developmental Biology* 7, no. 2 (2018),

⁵ Justin Darcy and Yu-Hua Tseng, “The Link between Stress and IL-6 Is Heating Up,” *Cell Metabolism* 32, no. 2 (2020): 152–53, <https://doi.org/10.1016/j.cmet.2020.07.011>.

CHAPTER THREE

EFFECTS OF THE SURVIVAL RESPONSE

Now that you understand how galectin-3 works, let's investigate the havoc it wreaks.

Imagine you are outside, sitting peacefully in nature. Perhaps there is a small creek running near you, its water tumbling over the rock bed. The sun breaks through the trees, warming your back. You feel yourself letting go of all your worries, until you are completely relaxed and at ease.

Now come back to your present circumstances and think about all the things you need to do, all the commitments and appointments for the week: the unanswered emails, texts, and phone calls. Can you feel the anxiety rise or a shift in your state of mind? If so, you have just triggered your internal alarm.

What causes us to shift into a hypervigilant mode, all the way down to the level of our biochemistry? *Our need to survive.*

There are many strategies for survival. We can survive by hiding, which is a containment strategy. We can survive by fighting, running away, or shutting down the defense mechanisms of our enemies. We can survive by eating less or by eating foods that break down slowly. But no matter the strategy, the survival drive is an individual instinct, and it's often every

person for themselves.

The survival instinct has been enhanced throughout our evolution. From an evolutionary point of view, our most important mission is to create the next generation. This means that we need the ability to develop healthy cells and healthy tissues and organs—a healthy individual needs to survive long enough to fulfill their evolutionary obligations.

Today, the basis for evolution still hasn't been completely settled among scientists. Some still believe in natural selection as the driving force of evolution, while others support the idea of random mutations as the primary driving force. I believe it's limiting for us to think that evolution is random at its core, but whatever the theory, it is true that we are driven by the need to survive.

Our survival mechanisms, however, seldom work in the long run. With the unprecedented speed of rapid cultural change and new technological advances, our evolutionary adaptation cannot possibly keep up! We are evolutionarily primed to have an alert response more fitting for the dangers our ancestors faced in the wilderness, although such dangers are long gone. Our survival drive responds accordingly—even if it is at the cost of our health and happiness. In the words of Aaron Beck, father of both cognitive therapy and cognitive behavioral therapy, “The cost of survival of the lineage may be a lifetime of discomfort.”

For example, though modern culture thrives on competition and self-distinction, our competitive drive and self-oriented behavior can leave us feeling isolated and alone. Loneliness causes a natural withdrawal that is increasingly self-oriented, and lonely individuals tend to focus more on their own needs.⁶ This is posited to be an evolutionary self-preservation instinct, which may have served us in our hunter-and-gatherer days—for

instance, if we were separated from our group and had to survive on our own. Under such circumstances, being alone would require a degree of self-focus. Who else could fend for us if not ourselves? It would also require us to be hypervigilant.

Certainly, such adaptive traits once helped us survive. But in our modern-day existence—where booming cities and concrete highways have replaced predator-filled plains—these traits can function in maladaptive ways. An interesting study published in 2017 evaluated 229 participants over a period of ten years. The study found that feelings of loneliness predicted self-centeredness, while self-centeredness was associated with subsequent loneliness, creating a vicious cycle.² Notably, numerous studies have shown that loneliness and isolation have been associated with serious health conditions, including stroke, coronary heart disease, increased blood pressure, diabetes, Alzheimer's disease, stress, and depression.⁸ What may have once been a mechanism that helped us survive is actually making us sick!

When we move *away* from our individual survival focus and cultivate greater social connection, community, and compassion, we can live healthier and happier lives. Compassion encourages us to expand beyond the microenvironment of our own personal narrative, activating a greater sense of connectedness to others. This promotes greater physical and mental well-being, reducing anxiety and inflammation while positively impacting our immune system.²

Looking more closely at our survival mechanisms, we know the body creates a survival response to different stimuli and triggers. They can be physical, emotional, mental, psychological, spiritual, environmental, or even *epigenetic* (heritable changes in gene expressions without an alteration in

the DNA sequence). But regardless of the origin, the body elicits the same biochemical response to each one: it sounds the alarm, which starts the inflammatory response cascade.

THE INFLAMMATORY RESPONSE

We've all heard about chronic inflammation and its detrimental effects. Inflammation is often synonymous with trouble, and for good reason, but inflammation is a necessary protective response mechanism. It's our way of responding to and fighting different threats. When it comes to survival as a protective mechanism, we must be equipped to initiate an immediate response, a short-term response, and sustain a balanced long-term response.

You also may have heard that inflammation is the cause of different health conditions and diseases. But if inflammation is a response, *how can it be the cause?* Inflammation is the response mechanism of the body to different insults such as tissue injury, infection, physical and emotional trauma, or exposure to poisons and chemicals. So, why does this vital function lead to so many problems down the line?

If you've ever sustained an injury, then you are familiar with the four classic signs of acute inflammation:

- Redness (due to increased blood flow to the injured area)
- Swelling (due to the accumulation of fluid)
- Pain (due to the swelling)
- Decreased range of motion

While these symptoms are unpleasant, a controlled, acute inflammatory

response has a clear beginning, middle, and end—it starts and stops, and it serves several protective roles. For instance, swelling occurs because the space between cells in the vessel wall expands, allowing fluids and immune cells to penetrate the area. This prevents the spread of infectious agents, removes damaged tissues and pathogens, and assists in the body's repair processes. You can think of acute inflammation as a controlled brush fire, meant to clear the brush and prevent larger, uncontrolled fires later on.

Once healing is complete, the inflammation clears out of the system, and no waste products should remain. So, why are there times when the inflammatory process won't stop? The answer is simple: if the body is stuck in survival mode, it senses that the problem hasn't been resolved, and the process continues. Galectin-3 causes the survival alarm to stay on, and as a result, it doesn't allow the inflammatory process to come to a smooth and swift end.

To make matters a bit more complicated, disease processes can also create their own survival modes, especially when they are independent entities like infections, or they have their own regulatory mechanisms, like cancer.

For example, an infection can create an isolated environment by utilizing galectin-3—it builds a biofilm to avoid immune recognition. This allows the infection to go into a dormant state and “hide,” creating local, low-level damage but without activating the generalized immune system. However, when the body encounters stress and shifts into survival mode, the infection responds to the change in environment.¹⁰ Like smoldering embers fanned by strong wind on a hot day, the infection leaps to life, becoming a roaring wildfire. One common infection where this can occur is in candida (a yeast naturally found in the body): the infection is dormant, but once there is enough stress in the body, or the immune system is weakened, it

will emerge. This can also happen with different types of fungi, parasites, viruses, and *Borrelia*, the spirochete (spiral-shaped bacteria) that causes Lyme disease.¹¹

The Role of Cellular Stress

To understand what makes an acute condition shift to chronic illness, we must first explore the concept of cellular stress and its role in low-level inflammation. Cellular stress begins in the extracellular space (the space between cells) within the connective tissue. This is where communication takes place between cells, and this is where galectin-3 does its damage: it draws inflammatory compounds into the extracellular space, and once it binds to them, it creates the lattice formation. This allows the slow-developing inflammatory response to occur in isolation, away from the body's "radar."

The changes in the extracellular space will then affect the cell membrane. Galectin-3 will attach to receptors on the cell membrane (the cell surface). Think of these cell surface receptors as a "docking station" for specific molecules and proteins. The cell surface receptors will affect and regulate how the membrane functions and, as a result, will affect the processes inside the cell. Galectin-3 blocks or alters these receptors, thus shifting cell metabolism and function into a stressed survival mode. Once the cell is locked into this state, all hell breaks loose. The mitochondria stop functioning properly, anaerobic glycolysis switches on, the intracellular pH changes, inflammatory by-products are produced and excreted, and cellular damage ensues. The key that ignites all of this is galectin-3!

RADIATION AS INFLAMMATION

Our bodies are constantly exposed to different kinds of radiation, both ionizing

and nonionizing. The radiation can originate from cell phones, TVs, computers, electromagnetic fields, medical imaging, cosmic radiation, and other sources. If we compare the amount of radiation we are exposed to today versus our exposure one hundred years ago, it's exponentially greater. Some experts estimate that it's even a trillion billion times greater!¹² Really, we can't even comprehend the number. And guess what? Radiation is a type of chronic, low-level inflammation. (See Appendix F for more information.)

MINIMIZING INFLAMMATION

Multiple diseases are driven by chronic inflammation, and if we can regulate galectin-3, we can influence them at the source. Anything that produces heat in the body will have an inflammatory effect, and anything that “cools” the system, turns down the heat, and creates space will help reduce inflammation. When I say “space,” I’m initially referring to physical space, such as a healthy, better-oxygenated extracellular space within a joint, with minimal inflammatory by-products. But I’m also referring to space in the context and perception of time; we must have more time between actions and allow more time for “letting go” in our lives. This means we must create space in our emotional and mental responses. We also need to create space in our physiology, all the way down to the biochemical processes in our body.

It's easier to make a sharp turn while driving twenty miles per hour rather than one hundred. Slowing down is the key to creating space and cooling inflammation. It's a matter of shifting from a reactive survival mode into a harmonious, relaxed one—a movement to a place where kindness, love, and compassion replace anger and resentment. Adjusting our activities and lifestyle will allow us to do just that.

We can cool the body and create space by getting sufficient sleep,

reducing stress, staying hydrated, eating an anti-inflammatory diet, and engaging in regular exercise and movement. Meditation creates space between thoughts, and as a result, can reduce inflammation. I know from my own experience that the reduction of inflammation as a by-product of meditation is an ever-evolving process. Even though I've practiced meditation for many years, I still fall into the habit of testing my capacity and overloading my system. My personal method for creating space is taking longer periods of time for cooling and for repair, but each of us has to find our own formula. (We'll discuss specific strategies to reduce inflammation as it applies to specific conditions later in the book.)

We often take anti-inflammatory herbs or medications to reduce inflammation, but the real path to healing comes when we change the survival process at the source—when we change our fixation and allow for change and flow.

Fixation and flow are the catalysts of important relationships in our life and our health. Fixation can affect us on the mental, emotional, and physical levels. It's possible to be stuck in mental fixations, like obsessive-compulsive behavior and overthinking. Or we can be emotionally fixated, unwilling to let go of certain feelings. If we're fixated on harmful or negative emotions such as anger and resentment, it can affect our physiology and cause our health to deteriorate. It will degrade our immune, cardiovascular, and metabolic systems, and can manifest as fibrosis.¹³

On the other hand, when things move too fast and we lose our healthy flow, it can lead to inflammation. This can result in reducing the “inner space,” the place and time where the body can detoxify and get rid of the by-products of enhanced metabolism. Inflammatory heat will also damage and reduce our inner lubrication—it affects the water content in our bodies

and our ability to detoxify and neutralize free radicals and their effects.

FIXATION: A FORM OF MENTAL FIBROSIS

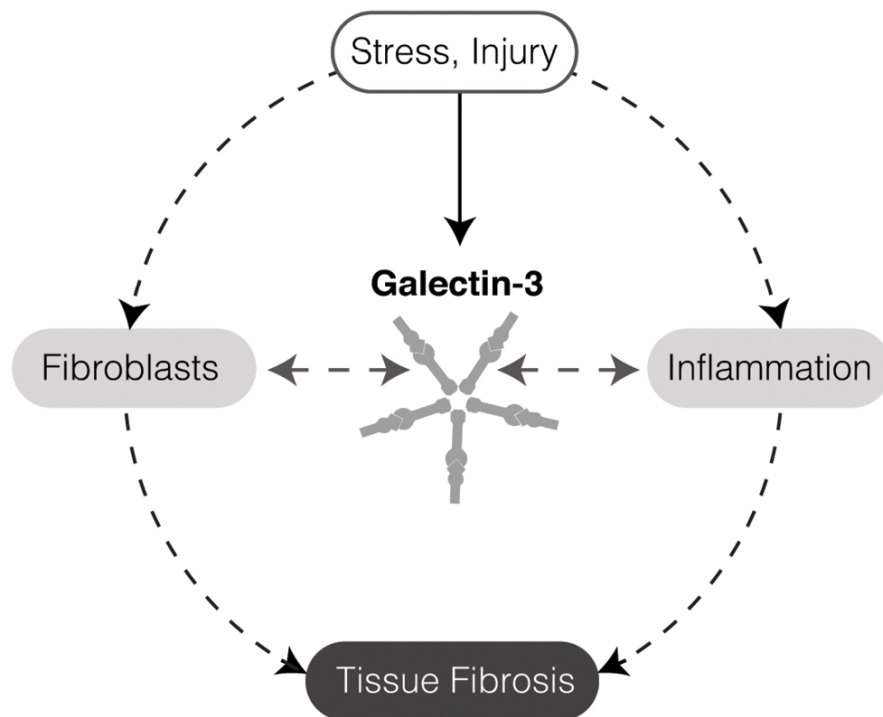
Fixation is a form of mental fibrosis—it's a lack of movement in our thinking processes that can affect our perception and experience of the present, past, and future. For example, obsession and compulsion are emotional fixations in the present, guilt is a fixation on the past, and worry and fear are fixations on the future.

THE INTERPLAY OF INFLAMMATION AND FIBROSIS

Inflammation and fibrosis are closely related and interdependent, and the survival response the body chooses can emphasize the inflammatory or the fibrotic pathway. The response is influenced by genetic, epigenetic, and acquired tendencies, as well as the condition itself. These factors determine which pathway the body will take, and sometimes one will compensate for the other.

For example, certain people follow more of an inflammatory pathway because they have a strong survival response. In other words, their bodies react to a survival challenge more aggressively with greater force and reactivity, creating greater friction. Other people who are unable to mount a proper response will move in the direction of contraction and isolation, and these tendencies will express themselves in fibrotic-dominant processes. It's important to recognize that both the fibrotic and inflammatory process will end up causing tissue damage and organ dysfunction when they run rampant—both pathways result in fibrosis.

Galectin-3 Drives Tissue Fibrosis



Our role in the healing journey is to recognize that these two fundamental processes drive every chronic disease—and to realize that *both* of them stem from the survival response. They are reflected in the very basic survival-driven function of the sympathetic nervous system: we either fight, which is an inflammatory process, or we engage in fear, which results in contraction, stagnation, and fibrosis. Both are recognized by the body as responses to danger.

In order to create healthy responses that do not result in damaging consequences, we need to recognize the causes of inflammation and fibrosis and address the survival drive that precedes them. If not addressed, an imbalanced survival drive can create immune dysfunction, hypoxia, and

inflammatory, fibrotic, and cancerous processes. Our fixations, or the inability to “let go,” can lead to rigid behavioral and physiological patterns. It will affect us mentally, emotionally, and yes, *physically*.

⁶ John T. Cacioppo, Stephanie Cacioppo, and Dorret I. Boomsma, “Evolutionary Mechanisms for Loneliness,” *Cognition and Emotion* 28, no. 1 (2013): 3–21, <https://doi.org/10.1080/02699931.2013.837379>.

⁷ John T. Cacioppo, Hsi Yuan Chen, and Stephanie Cacioppo, “Reciprocal Influences Between Loneliness and Self-Centeredness: A Cross-Lagged Panel Analysis in a Population-Based Sample of African American, Hispanic, and Caucasian Adults,” *Personality and Social Psychology Bulletin* 43, no. 8 (2017): 1125–35, <https://doi.org/10.1177/0146167217705120>.

⁸ Louise C. Hawkey, Ronald A. Thisted, Christopher M. Masi, and John T. Cacioppo, “Loneliness Predicts Increased Blood Pressure: 5-Year Cross-Lagged Analyses in Middle-Aged and Older Adults,” *Psychology and Aging* 25, no. 1 (2010): 132–41, <https://doi.org/10.1037/a0017805>.

Raheel Mushtaq, “Relationship Between Loneliness, Psychiatric Disorders and Physical Health? A Review on the Psychological Aspects of Loneliness,” *Journal Of Clinical And Diagnostic Research*, 2014, <https://doi.org/10.7860/jcdr/2014/10077.4828>.

Nicole K. Valtorta, Mona Kanaan, Simon Gilbody, Sara Ronzi, and Barbara Hanratty, “Loneliness and Social Isolation as Risk Factors for Coronary Heart Disease and Stroke: Systematic Review and Meta-Analysis of Longitudinal Observational Studies,” *Heart* 102, no. 13 (2016): 1009–16, <https://doi.org/10.1136/heartjnl-2015-308790>.

⁹ Fulvio D’Acquisto, “Affective Immunology: Where Emotions and the Immune Response Converge,” *Psychoneuroimmunology Dialogues in Clinical Neuroscience* 19, no. 1 (2017): 9–19, <https://doi.org/10.31887/dcns.2017.19.1/fdacquisto>.

¹⁰ Philipp Kämmer, Sylvie Mcnamara, Thomas Wolf, Theresia Conrad, Stefanie Allert, Franziska Gerwien, Kerstin Hünig, et al, “Survival Strategies of Pathogenic Candida Species in Human Blood Show Independent and Specific Adaptations,” *mBio* 11, no. 5 (2020), <https://doi.org/10.1128/mbio.02435-20>.

¹¹ Linda K. Bockenstedt, R. Mark Wooten, and Nicole Baumgarth, “Immune Response to Borrelia: Lessons from Lyme Disease Spirochetes,” *Lyme Disease and Relapsing Fever Spirochetes: Genomics, Molecular Biology, Host Interactions and Disease Pathogenesis*, 2021, <https://doi.org/10.21775/9781913652616.18>.

¹² Federal Communications Commission, “Irradiated: A Comprehensive Compilation and Analysis of the Literature on Radiofrequency Fields and the Negative Biological Impacts of Non-Ionizing Electromagnetic Fields (Particularly Radiofrequency Fields) on Biological Organisms,” <https://ecfsapi.fcc.gov/file/1060927842647/irradiated.pdf>.

¹³ Joel E. Dimsdale, “Psychological Stress and Cardiovascular Disease,” *Journal of the American College of Cardiology* 51, no. 13 (2008): 1237–46, <https://doi.org/10.1016/j.jacc.2007.12.024>.

Suzanne C. Segerstrom, “Stress, Energy, and Immunity,” *Current Directions in Psychological Science* 16, no. 6 (2007): 326–30, <https://doi.org/10.1111/j.1467-8721.2007.00522.x>.

CHAPTER FOUR

HOW THE SURVIVAL RESPONSE OPERATES

Now that you have an idea of the damage done, let's investigate exactly how it happens.

The survival response is innate in each of us. It is built into our self-identity; it allows us to distinguish between *self* and *other*. For example, our immune system recognizes our body's cells as "self" while identifying foreign material as "other," which it will then work to eliminate. As such, we need to be able to initiate a survival response instantly, instinctively, and without thinking about it. This is done by the sympathetic nervous system, which elicits the immediate autonomic response: fight or flight.

All expressions of the survival response are built in and innate, and can happen in a fraction of a second. But the response can also be turned off relatively easily by the *parasympathetic system*. The parasympathetic system balances the sympathetic system and is in charge of shifting the body to a state of balance, harmony, peace, and safety. Think about it this way: if the sympathetic system is your workweek, the parasympathetic system is the weekend. Without the latter's proper function, our survival response would very quickly go out of control.

Based on different perceived threats, the body adjusts its functions in

order to support and sustain both short-term and long-term survival responses. It accomplishes this through the metabolic system (the way our cells use nutrients to produce energy). Basically, the metabolic system shifts into crisis-management mode in order to support the sympathetic system as it launches a survival response.

Let's zoom in even farther and find out what's happening at the cellular level.

WHEN CELLS WORK UNDER DURESS

During times of normalcy when we are not under survival threat, the cell produces energy called adenosine triphosphate (ATP) by utilizing oxygen to process glucose. This process, known as aerobic metabolism, takes place inside the mitochondria, the intracellular organelle responsible for energy production. Healthy mitochondrial function is a key component of health and longevity.

However, when the body and, as a result, the cell (or vice versa) is under survival threat, it needs to produce energy much faster. The cell doesn't have time to produce energy through aerobic metabolism, so it instead produces energy through glycolysis—a.k.a. anaerobic metabolism (since it doesn't use oxygen).

When anaerobic glycolysis kicks in, the cell can produce energy one hundred times faster than through aerobic metabolism, but at a *huge cost*.¹⁴ When the cell does not utilize oxygen, it is much less efficient (it produces only two molecules of ATP for every one of glucose, compared to thirty-six molecules of ATP during aerobic metabolism). Anaerobic glycolysis also ends up producing *lactic acid*, a problematic by-product that changes the cell's acid-base balance, which can produce *acidosis*. This causes excessive

acidity not only in the cell and its environment but eventually also in the body's circulation.

As anaerobic glycolysis requires a large amount of sugars, or glucose, the short-term metabolic survival response is glucose dependent. Glycolysis is ramped up in times of danger, when energy needs to be supplied very quickly. It's used as a short-term survival mechanism when the person, the organ, the tissues, and the cell are in a state of stress. As a result, the mitochondria are not able to function properly, and this can lead to *mitochondrial dysfunction*—the inability of the cell to produce energy efficiently—which is at the root of many chronic diseases. This is what's behind the phrase “stress kills.” The shift from aerobic metabolism to anaerobic glycolysis can literally lead to chronic disease.

When the body is engaged in a survival response, it will continue to do so even after running out of glucose. A classic example of this is during starvation—the body is not getting sufficient glucose and needs to find an alternate way to survive. We do this by converting the production of energy from glucose to fat-derived ketones (which is the basis of the popular ketogenic diet). *Ketosis*, or the use of ketones for energy production, is an *alternate* long-term survival mechanism that allows us to survive for weeks at a time, but it's still not how a cell functions in times of normalcy, peace, and harmony.

While individual cells need to survive, they are inherently impermanent. Cells are created through mitosis, where they duplicate and divide. Once a cell reproduces, it has served its existential purpose for survival, and when it ends its life cycle, another cell with the same function will take its place. At some point, the cell will die through the process of *apoptosis*, or programmed cell death.

WHEN CELLS ARE HIJACKED

Cells are innately “aware” of their function as part of a bigger picture, much like the awareness of a single bee in a beehive. A single bee knows that she is a part of a larger community, and works for the good of the colony.

When a cell is normal and healthy, it doesn't feel threatened, and it engages in proper communication with its environment. It has the time and ability to create normal metabolic processes that are essential for efficient energy production and overall function.

But as amazing as our cells are, galectin-3 can dramatically disrupt communication within the intricate community of the body. It interferes with cell receptors by attaching to the surface of normal cells and hijacking their communication signals. As a result, galectin-3 interrupts the immune system and ramps up the fight-or-flight survival response.

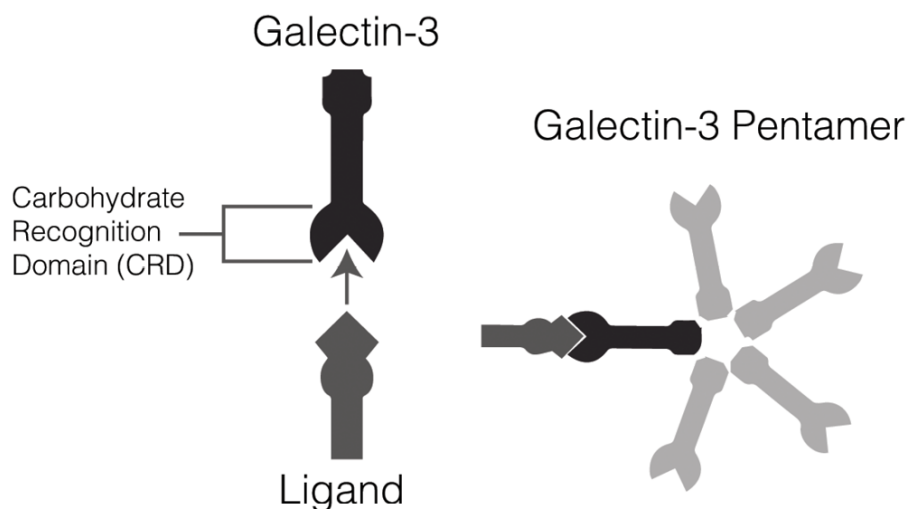
Recall from our previous discussion that when a cell goes into survival mode, it switches its energy production system to anaerobic glycolysis, which produces energy much faster but creates lactic acid in the process. This can induce hypoxia, produce inflammation, create damaging free radicals, and result in oxidative stress, a condition in which the body is unable to rid itself of these free radicals. This fight-or-flight response and its proinflammatory by-products eventually damage the cell and its environment. A damaged cell can start to behave as though it's being threatened, and it will refuse to die and allow a new cell to take its place. It will start to duplicate uncontrollably as part of its survival response. This is where conditions like cancer can begin.

How is galectin-3 able to elicit so many different cellular responses? It can bind to a wide variety of molecules, including those on the cell surface and in the extracellular space, as well as a specific kind called *ligands*

(biologically active molecules that can bind to proteins). And of course, galectin-3 can also bind to itself, such as when it creates pentamers.

The specific ligands that bind to galectin-3 do so via their carbohydrate or sugar components, which attach to galectin-3's carbohydrate recognition domain (CRD). By having different ligands—which drive different functions—attach to its CRD, galectin-3 can wind up initiating and affecting a great variety of responses and outcomes.

Galectin-3 Structure and Pentamer



The kind of ligands that attach to galectin-3 can determine the effect that galectin-3 will have. Additionally, galectin-3 can deliver specific ligands to targeted tissues where the ligands then exert their specific effects. For example, ligands that promote growth of blood vessels can be delivered to the cancerous tumor by galectin-3, thereby increasing blood vessel growth and blood supply to the tumor. This enables the cancer to grow faster and become more aggressive. In this way, galectin-3 can actually *feed and fuel*

these tumors by triggering *angiogenesis* (blood vessel formation).

We've discussed how galectin-3 pentamers scaffold together to create a coating known as a lattice formation. This helps establish cell microenvironments and allows cells with a common adversarial function against the body to stick together. This can take place through the use of a class of ligands called *integrins*—molecules that “stick” cells together, creating communities of cells that are independent from the rest of the body. Integrins are attached to the CRD of galectin-3, and they are then delivered to their destination, where they can stick to the target tissue. In this way, integrins are directly related to the metastatic process, which allows cancer to thrive while the host body withers away.

For these reasons, galectin-3 has been termed the “guardian of the tumor microenvironment.”

THE MICRO MIRRORS THE MACRO

I'm sure by now you see my inclination to correlate the macro and micro cosmos. I relate what we experience as individuals, communities, and the planet to what is happening at the cellular level. This is not arbitrary; these are all different manifestations of the same basic principles.

As individuals, we experience life through our senses—we perceive sensory input from the outside, as well as through our inner thoughts, feelings, and body sensations. Our skin forms a visible boundary between us and the outside world, and we interact with our surroundings through breathing, eating, drinking, and communication. We are the center of our own reality, and we experience everything around us from an individual perspective. Yet we are part of a family, community, nation, planet, solar system, and beyond.

When we explore this concept on the cellular level, we see that our DNA allows the expression of different proteins and compounds, and forms our genetic makeup. The same information—the same DNA—is present in each and every one of our cells. Each cell is capable of producing energy to sustain itself, and each one has a boundary known as a membrane. The membrane is semipermeable, meaning it decides what comes into the cell, and what goes out of it. The cell membrane regulates the process through different channels, pumps, and receptors on the cell surface—it's a functioning unit that is part of a larger entity, a human life. Just like us, the cell behaves a certain way based on signals from within and outside itself, and as a result, it produces various biochemical compounds such as hormones, proteins, and signaling molecules.

The Miracle of Life

Each of us is a true miracle! We are made of tens of *trillions* of cells, each of them undergoing up to one million reactions every second. These cells have different functions but work together in harmony with one goal in mind: to keep us alive biologically and allow us to fulfill our purpose and aspirations. Furthermore, each person is an individualized expression of endless combinations of genetic information from millions and billions of ancestors over many millennia. Can you see why I am in awe thinking about the miracle of being alive?

Survival is based on self-interest. Every cell and every organ in the body follows this principle. A cell takes in what it needs for survival and excretes any by-products that are no longer needed. If the cell loses its responsibility to the community, it can excrete compounds that damage its environment and, over time, itself as well. This illustrates the survival paradox at the micro level—while being analogous to environmental health concerns we

have created on earth at the macro level.

Our survival as a species on this planet has also been based on self-interest. We pull from it whatever we want for our bodies, homes, and businesses and excrete any by-products we no longer think we need. And just like a cell, when we lose responsibility to our true community—the delicate ecosystem from which we spring—we damage not only the environment but also ourselves.

Fortunately, the micro and macro not only mirror one another but can heal one another. When we shift away from a survival response within our bodies, we will simultaneously do so globally, and vice versa. There is a way to thrive holistically. As I've said, there's always a path toward healing if we choose it.

¹⁴ Erica A. Melkonian, “Biochemistry, Anaerobic Glycolysis,” StatPearls, US National Library of Medicine, October 1, 2020, <https://www.ncbi.nlm.nih.gov/books/NBK546695/>.

CHAPTER FIVE

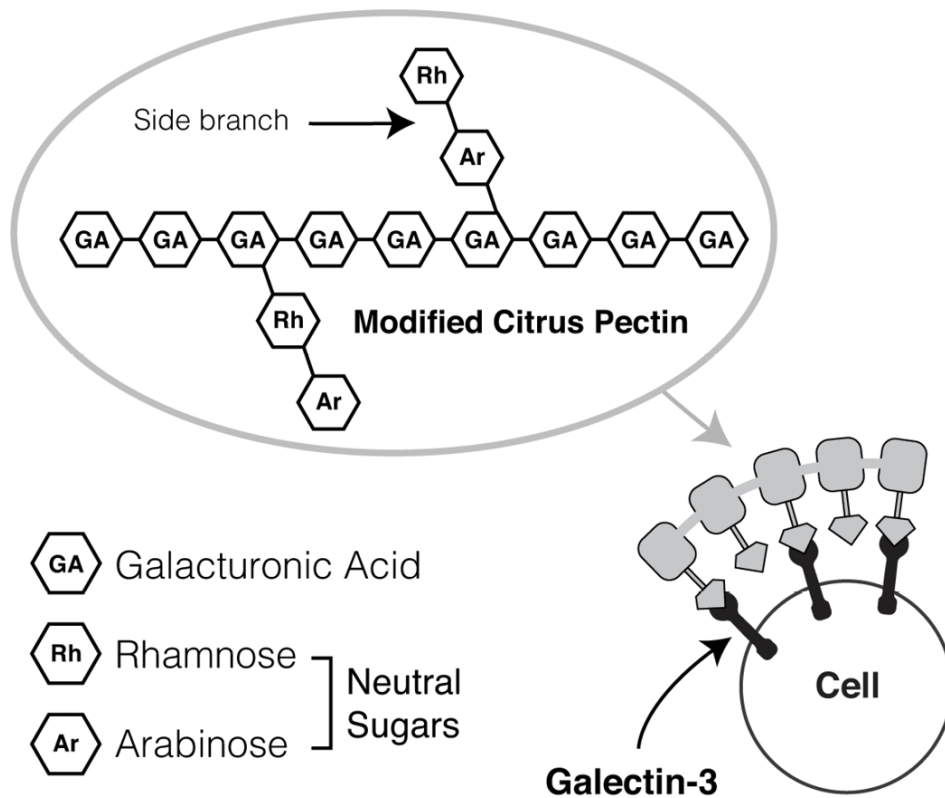
A GIFT FROM NATURE: MODIFIED CITRUS PECTIN

Now that you understand how the survival response and galectin-3 operate within the body, we'll explore a bit of good news: a way to interrupt this response at the biochemical level.

More than seventy published studies have demonstrated the ability of a very specific and humble compound to block the devastating effects of galectin-3. I say “humble” because it is derived from citrus fruits. This amazing gift from nature is a low-molecular-weight form of pectin called *modified citrus pectin* (MCP).

Let's take a moment to define *pectin* in general. It is a fiber. Structurally, pectin is a long chain of carbohydrates, mostly a specific one called galacturonic acid. This chain of galacturonic acid has a large molecular weight ranging between 200–300 kilodaltons. (For my technical readers: pectin also has side branches composed of different neutral sugars like arabinose, rhamnose, and xylose.) When the pectin comes from citrus, it is known as citrus pectin.

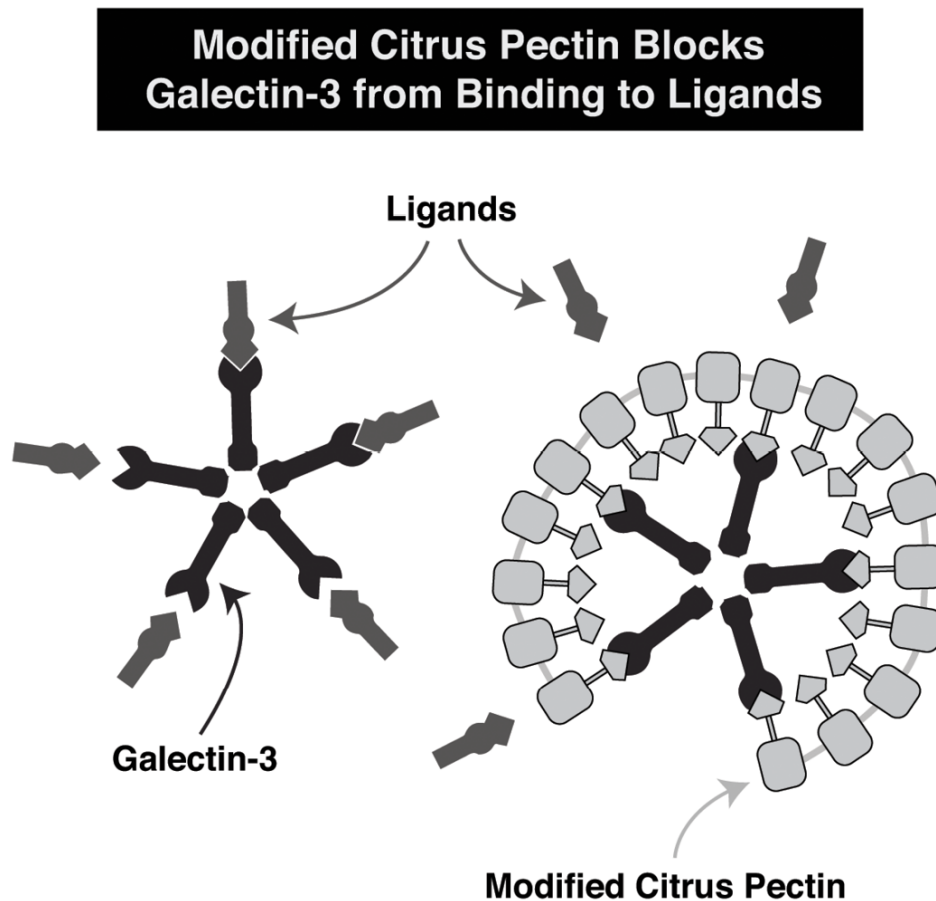
Modified Citrus Pectin Structure



Importantly, regular pectin is not absorbed into the bloodstream and therefore cannot block galectin-3. There are still health benefits to it, as a fiber—since its carbohydrate chain is very long and isn't digested or absorbed, it remains in the gut, where it can improve gut health. However, in order for citrus pectin to block galectin-3, it must be modified into a substance with a low molecular weight.


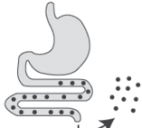
Unlike pectin, these modified molecules are much, much smaller: 3–13 kilodaltons, compared to the 200–300 kilodaltons of regular pectin. The smaller-sized molecules allow the compound to enter the bloodstream through the digestive tract. Once there, because of its specific structure, it can bind to galectin-3 and block its devastating effects. Essentially, MCP

connects to galectin-3's carbohydrate recognition domain, which has an affinity for the galacturonic acid present in MCP. In this way, MCP prevents galectin-3 from interacting with cells and tissues.



Frustratingly, there are forms of MCP on the supplement market which have molecules that are not small enough to enter the bloodstream—this is why I refer to the form of MCP I'm discussing as having a low molecular weight. In order for MCP to effectively block galectin-3, it must undergo very precise changes in its structure through a specific pH and heat-controlled enzymatic process. This not only reduces the pectin fiber to a tiny, absorbable size but also gives it the ability to bind to and block galectin-3. For this reason, I only recommend a form of researched MCP

that has undergone this process. Fortunately, this form of low-molecular-weight MCP is an extremely safe compound, classified as GRAS (Generally Regarded as Safe) by the FDA. Now that you understand the molecular-weight distinction, for the sake of brevity, I will refer to the compound only as MCP.

Modified Citrus Pectin versus Regular Citrus Pectin		
	Other Citrus Pectins	Low Molecular Weight Modified Citrus Pectin
Molecular Weight	150 - 300 kDa	< 15 kDa
Degree of Esterification	Varies	< 10%
Clinically Proven	No	Yes
How It Works	 Stays in GI Tract	 Systemic Absorption

MY PERSONAL INVOLVEMENT

Before we get into the science and research on MCP, I'd like to share my personal involvement in its development and why it is so near and dear to me.

I grew up in a suburban neighborhood in Ramat Gan, Israel. One

evening in 1971, when I was twelve years old, my parents and I visited our neighbors, Drs. Leo and Ruth Cohen. Both were PhDs in organic chemistry and pioneers in the citrus industry of Israel—they were the head scientists at Israel's leading citrus production conglomerate.

During our visit that evening, we engaged in lively conversation. Suddenly, Ruth turned to me out of the blue and said, “Isaac, one day they will find a treatment for cancer in the peels of citrus fruits.” For some reason, Ruth's statement stuck in my mind. Then, twenty-four years later in 1995, after I graduated from medical school and obtained my master's of science in traditional Chinese medicine, a study in the *Journal of the National Cancer Institute* caught my attention. In the study, mice with prostate cancer were given MCP. Amazingly, there was a dramatic decrease in the number and size of lung metastasis in the mice that had consumed the MCP compared to the mice that hadn't. This was the result of the inhibition of galectin-3.

Intrigued, I called Dr. Ruth Cohen. I reminded her of what she told me twenty-four years earlier and shared the study results with her. I asked if she could help me make the most effective form of MCP, and Ruth delightedly connected me with some of the leading pectin scientists in the world. This began my journey with MCP, which was initially sparked on that pivotal day when I was twelve and has been unfolding ever since.

It has been a journey of discovery. If you looked at my medical charts twenty years ago, you would not have necessarily seen MCP at the top of my patients' suggested therapies. Sometimes it wasn't on the list at all. However, over the years, I've conducted extensive research on MCP, including its application in reducing the severity of cancer, enhancing the immune system, removing heavy metals, inhibiting and reducing

inflammation and fibrosis by blocking galectin-3, and its ability to positively impact many chronic conditions and diseases.¹⁵ I now recognize that it is perhaps the most important supplement we have in our efforts to treat and prevent chronic disease.

Today, the MCP I developed and researched is available for use as a dietary supplement. I often say that if it were a drug, I believe it would be widely prescribed. But since it's a natural product extracted from the peels of citrus fruits, it's a dietary supplement and, as such, receives much less attention. Many of my colleagues call it “the best-kept secret in integrative medicine.” Although it's taken twenty-five years, low-molecular-weight MCP is finally starting to get the recognition and appreciation it deserves.

HOW DOES MCP WORK?

MCP interferes with the inflammatory process by binding to galectin-3's carbohydrate recognition domain—preventing galectin-3 from otherwise binding to ligands, interacting with cells, or forming lattice structures. By disrupting the cell-to-cell, cell-to-galectin-3, and galectin-3-to-galectin-3 interactions, MCP creates an environment that is inhospitable to inflammation, fibrosis, hypoxia, infection, and cancer cell growth.¹⁶ In the case of cancer, for example, it removes the galectin-3 that “shields” the cancer, and blocks the galectin-3 that inhibits the immune response. This wakes up the immune cells and enhances the normal immune response, making the immune cells more effective.

While MCP blocks galectin-3 in places where it causes damage, tissues that require galectin-3 still express galectin-3 where it's needed. This is the wonderful thing about MCP: it doesn't *inhibit* healthy cellular function and injury repair but rather mitigates the harmful consequences of galectin-3.

And MCP's beneficial effects extend beyond galectin-3 binding. It can also bind to heavy metals and help remove them.¹⁷ Further, it has a powerful immune-enhancing effect. This is because of a side structure in the MCP called *rhamnogalacturonan II*, which improves the immune response.

EVIDENCE OF MCP'S EFFECTIVENESS

Years ago, before I discovered the role of galectin-3 in inflammation and fibrosis, I witnessed an interesting phenomenon: MCP quickly reduced pain in my patients. They reported that their arthritis, back pain, and sometimes even pain from cancer had resolved or improved in just a few days.

I asked myself, "How can this be?" I thought maybe it was due to MCP's ability to remove heavy metals, but the resulting pain relief happened so quickly, it was puzzling. Now, after years of research, we know that blocking galectin-3 reduces inflammation and fibrosis, and can therefore not only help relieve pain but also positively impact a wide spectrum of conditions.

It's especially striking to look at the benefits of MCP in inflammatory-driven cardiovascular conditions. There are close to twenty animal studies published in major journals reporting the consistent ability of MCP to stop and even reverse arteriosclerotic damage. Only one single study showed that MCP didn't work, and when you read it carefully, you can see that it didn't work because it was a *different type of MCP* with a higher molecular weight. This demonstrates the importance of using the correct MCP—MCP is only effective when it is properly modified.¹⁸

My research team and I have been collaborating with Dr. Avraham Raz

from Wayne State University, head of the group that published the original landmark MCP research in the *Journal of National Cancer Institute* in 1995. I am grateful to Dr. Raz for his pivotal contribution to the field of galectin-3 and MCP. Through our collaboration, we've been able to utilize antibodies to identify MCP in the bloodstream. By using this method, we demonstrated for the first time that MCP is absorbed into the bloodstream, where it can exert its benefits.

Because of its ability to block galectin-3, MCP benefits multiple systems throughout the body. When it comes to the metabolic system, it can improve insulin resistance, diabetes, metabolic syndrome, and obesity. MCP also works as an antioxidant and promotes mitochondrial health. By reducing inflammation and fibrosis, it inhibits the driving force for autoimmune and degenerative diseases. The same mechanism helps with postinjury healing, protects the blood-brain barrier, and can help heal stroke-inflicted brain damage.

In addition, MCP facilitates the growth of beneficial bacteria in the GI tract and inhibits the adhesion of harmful pathogens in the gut and the lungs. By breaking down the galectin-3 lattice formation, MCP doesn't allow microorganisms to hide and evade the immune system. It can even have an antimicrobial effect on pathogenic bacteria. To give an example, MCP demonstrates antimicrobial activity alone and in combination with cefotaxime, an antibiotic, against strains of methicillin-resistant *Staphylococcus aureus* (MRSA).¹⁹

These are just some of the highlights of MCP's effects. We'll discuss more about its influence on many conditions in the chapters to come.



JONATHAN'S STORY

After so many years spent working with MCP, I am still in awe of its effectiveness. The excitement I feel is renewed every time I live vicariously through a patient's wonder. My dear friend Jonathan was advised by his naturopath to start using MCP to help with the elimination of heavy metals and toxins. After a few months, Jonathan contacted me to ask about something that surely couldn't be possible—had MCP also resolved his long-term hypertension?

His blood pressure had been hovering at 140/90 for many years, and it was now 110/70. He didn't change anything with his diet or supplementation—he simply started taking MCP. I told Jonathan that, in fact, it was possible because MCP can block the harmful effects of galectin-3 on the cardiovascular system.

A few months later, I met with Jonathan again. This time, he told me that, although he'd been suffering from bleeding gums for years, the problem had suddenly resolved.

"Isaac," he asked, "it can't be possible that MCP has helped my gums, as well, can it?"

"Indeed," I replied, "it is certainly possible."

After that visit, his skepticism turned to supposition. When I saw him next, he had more good news. He told me he had always come down with a number of colds accompanied by cough and bronchitis each winter. However, this past winter, his immune system was stronger than ever, and

despite extensive international travels, he didn't get sick *at all*.

"It's because of the MCP," he announced.

I laughed and replied, "It's certainly possible."

ONE PART OF AN INTEGRATED APPROACH

By deactivating galectin-3 and breaking down its lattice formation, MCP uncovers the isolating microenvironments that can harbor damaging disease processes within us. From a symbolic point of view, galectin-3 is now raging in our country and on our planet. But there are tools to block the negative effects of division, isolation, and inflammation. On the physical level, we have tools such as diet and exercise. Now there is also MCP.

My approach in medicine is to see through symptoms to deeper causes and relationships. As such, I frequently advocate for a more multidimensional and sometimes complex approach to life and health. However, within the complexity, there are some very simple unifying principles. We cannot separate our cellular mechanisms from the larger cosmic forces that affect the world around us. Like the double helix of DNA, these strands are interwoven.

Keeping this in mind, if our survival response promotes isolation tendencies that can be so damaging, what can we do to counterbalance this? Is there a way for us to heal that is of larger scope, not only at the cellular level?

The answer lies in connecting with our essence and core, with who we truly are. Love is at the center of our creation. With some exceptions, humans are made in an act of love between their parents through a bond that has repeated itself generation after generation, dating back to all of our ancestors who are within our genetic makeup. This quality of love is present in each and every one of our cells, but we've lost this connection throughout our survival struggles.

However, there is one organ in the body that functions differently and continuously reminds us what it means to give without judgment. It offers us the built-in physiological opportunity to transform our survival reactivity into unconditional love and compassion. It takes in “dirty” blood that contains unwanted by-products from our cells and organs, transforms the quality of the blood through breath, and gives out “clean” blood to its environment and the rest of the body without discrimination. This organ is the heart.

It’s what I’ll focus on next, because when we connect with our hearts, anything and everything becomes possible.

¹⁵ Isaac Eliaz, John Guardino, and Kerry Hughes, “The Health Benefits of Modified Citrus Pectin,” ACS Symposium Series Potential Health Benefits of Citrus, 2006, 199–210, <https://doi.org/10.1021/bk-2006-0936.ch015>.

Isaac Eliaz, Arland T. Hotchkiss, Marshall L. Fishman, and Dorena Rode, “The Effect of Modified Citrus Pectin on Urinary Excretion of Toxic Elements,” *Phytotherapy Research* 20, no. 10 (2006): 859–64, <https://doi.org/10.1002/ptr.1953>.

Isaac Eliaz and Avraham Raz, “Pleiotropic Effects of Modified Citrus Pectin,” *Nutrients* 11, no. 11 (2019): 2619, <https://doi.org/10.3390/nu11112619>.

Isaac Eliaz, Elaine Weil, and Barry Wilk, “Integrative Medicine and the Role of Modified Citrus Pectin/Alginates in Heavy Metal Chelation and Detoxification—Five Case Reports,” *Complementary Medicine Research* 14, no. 6 (2007): 358–64, <https://doi.org/10.1159/000109829>.

Cheppail Ramachandran, Barry J. Wilk, Arland Hotchkiss, Hoa Chau, Isaac Eliaz, and Steven J. Melnick, “Activation of Human T-Helper/Inducer Cell, T-Cytotoxic Cell, B-Cell, and Natural Killer (NK)-Cells and Induction of Natural Killer Cell Activity against K562 Chronic Myeloid Leukemia Cells with Modified Citrus Pectin,” *BMC Complementary and Alternative Medicine* 11, no. 1 (2011), <https://doi.org/10.1186/1472-6882-11-59>.

Zheng Yan Zhao, Li Liang, Xiaoqing Fan, Zhonghua Yu, Arland T. Hotchkiss, Barry J. Wilk, and Isaac Eliaz, “The Role of Modified Citrus Pectin as an Effective Chelator of Lead in Children Hospitalized with Toxic Lead Levels,” *Alternative Therapies in Health and Medicine* 14, no. 4 (2008): 34–38, <https://pubmed.ncbi.nlm.nih.gov/18616067/>.

¹⁶ Eliaz and Raz, “Pleiotropic Effects of Modified Citrus Pectin,” 2619.

¹⁷ Eliaz, Hotchkiss, Fishman, and Rode, “The Effect of Modified Citrus Pectin.”

Eliaz, Weil, and Wilk, “Integrative Medicine and the Role of Modified Citrus Pectin.”

Zhao et al., “The Role of Modified Citrus Pectin.”

¹⁸ Isaac Eliaz, “Letter to the Editor: Not All Modified Citrus Pectins Are the Same: Size Does Matter,”

American Journal of Physiology-Heart and Circulatory Physiology 316, no. 5 (2019),
<https://doi.org/10.1152/ajpheart.00118.2019>.

¹⁹ Elias Dahdouh, Salah El-Khatib, Elias Baydoun, and Roula M. Abdel-Massih, "Additive Effect of MCP in Combination with Cefotaxime against Staphylococcus Aureus," *Medicinal Chemistry* 13, no. 7 (2017), <https://doi.org/10.2174/1573406413666170306112444>.

CHAPTER SIX

THE HEART OF TRUE SURVIVAL

Now you understand how to mitigate the effects of the survival response at the biochemical level. But what if you were able to transform the survival response altogether?

We know that every organ system within the body is connected, and all these systems must operate in harmony with each other. When cells openly communicate and cooperate with each other, it results in better health and longevity. Within this remarkable network of systems, the heart is the organ that allows us to shift from survival mode to health and harmony.

PHYSIOLOGY OF THE TRANSFORMATIVE HEART

Our majestic heart is designed for its transformative role. It is actually *built* to transform toxic and unwanted by-products into nourishment. *It is the heart's role in our survival, and without it, we wouldn't be alive.* Every other organ in the body gets blood through a “clean” arterial supply and releases unwanted by-products and toxins into the circulation. But not the heart. The heart takes in venous blood that is low in oxygen and high in carbon dioxide from the whole body—it doesn't matter where the venous blood comes from or what it contains. In exchange, the heart offers oxygenated arterial blood to the whole body.

Since the aorta, the main artery coming out of the heart, doesn't contract or expand like other blood vessels, it allows blood to flow everywhere

without determining where it goes first. How does the heart make this exchange? By connecting to the outside world, to the universe—through the lungs and breath.

The lungs release carbon dioxide and other unwanted by-products to the outside world during exhalation. In return, during inhalation, the lungs are nourished with clean, oxygenated air which passes into the blood and is delivered to the heart. The heart then offers the blood to the whole body. This process ensures the ongoing connection between us as humans, as independent entities, and our environment. And if you think about it, this connection is no different than the relationship between a single cell and its environment.

While there is a tendency to simplify and look at concepts, ideas, and experiences in a linear way, we are all multidimensional beings. The heart is not any different—its exchange of dirty blood with clean blood is expressed not only on a physiological level but on an emotional and psychological level as well. The heart has the ability to transform survival response-driven, negative, and harmful emotions such as anger, resentment, jealousy, fear, and others into unconditional love and compassion. The heart gives without taking a break, and without judgment as to who should receive. This transformative quality of the heart is innately who we are, and when the heart ceases to perform its role, we die.

In order to nourish the body, the heart has to receive dirty venous blood *from the body*. This is necessary for the ongoing transformation. And what does the heart nourish first in the process? It nourishes itself through the coronary arteries. The heart needs to take care of itself in order to take care of others! Even more, it takes care of itself as part of taking care of others. This is a profound understanding of the deeper role of the heart. We need

to love and nourish ourselves as part of loving and nourishing others, and this fundamental truth is expressed in our physiology.

GETTING TO THE SOURCE

Among the organs in the body, it is our heart that radiates the largest and most powerful magnetic field. This magnetic field is one hundred times stronger than that generated by the brain. It extends several feet outside the body, and in the process, it pervades every one of our cells, tissues, and organs.²⁰ This means the heart not only has a profound effect on our entire body but also on the space around us—we can actually be in each other’s “heart space.”

As we learn more about the interconnectivity inside of us, we come to appreciate the magical and miraculous complexity of our body. Human tendency is to put everything in boxes so we can address each one individually. We look for a specific solution to a specific problem. We are drawn to what seems most obvious—the immediate manifestation—and then we respond to it. For example, in most medical systems, if we see that an organ has a problem, our tendency is to respond by treating the problematic organ. This is a reactive, survival response—something I call “outer medicine.”

True healing requires deeper examination—we need to look for the root of the problem. For example, we treat the symptoms of congestive heart failure, but we often don’t consider treating the inflammatory process that caused the condition. And if we are looking at inflammation, we seldom explore the root cause of the inflammatory response. What we really need to address, however, is the survival response that triggers this inflammatory process—the one that resulted in congestive heart failure to begin with.

We can have different inflammatory triggers and pathways, which is why it's essential to understand and heal them. On a biochemical level, it's critical to block galectin-3. By doing so, we block the protein that ignites the inflammation process at its headwaters and contributes to the downstream cascade that drives every chronic disease. And on an emotional, mental, and psychospiritual level, we need to transform the triggers of the survival paradox. This transformative power is the secret gift of our heart: the heart of survival.



CHARLIE'S STORY

Charlie Rice was always there to lend a hand and to support with a smile, a good word, a hug, and an open heart. I first met Charlie when he came to the clinic with Shellie, his loving wife, in June of 2005. At the time, he had stage 4 prostate cancer that had metastasized to his bones, and his PSA (the marker for prostate cancer) was over 100. His journey with prostate cancer had started three years earlier in 2002. Our meeting commenced a deep healing journey for Charlie and Shellie, and a very meaningful friendship that lasted over thirteen years, until he passed away in April of 2018, after outliving stage 4 cancer for over fifteen years.

From his humble demeanor, you would have never guessed Charlie was a highly decorated Vietnam hero, someone who encountered immense adversity and danger. He spent a year in Vietnam with the 25th Infantry Division $\frac{3}{4}$ Cavalry. There, Charlie was an army helicopter pilot, as well as lieutenant in charge of the scout platoon. While most combat aircraft aim

to avoid danger by maintaining altitude, the OH-6 helicopters that Charlie piloted flew very low to the ground—as low as only ten feet above the ground covering. These OH-6 observation helicopters were paired with Cobra gunships to form teams. Charlie's helicopter searched for signs of the Vietcong, flying low enough to the terrain to be able to do so. When the enemy saw the low flying small OH-6, they would open fire on the helicopter. Now the Cobra gunship knew where to fire back.

Charlie was shot down eight times in a single year, and every time, he came back. As the Vietcong would often hide in villages near civilians, Charlie's team had to make difficult decisions in a split second that could cost lives either way—this, after he'd literally looked into the eyes of those who had been deemed his enemies, as a result of his proximity to the ground. Charlie suffered from severe PTSD. He would wake up with nightmares, experiencing his multiple helicopter crashes and seeing the people who shot him down, as well as those who had died at his own hand, in his bid to survive. Charlie was experiencing the survival paradox at its fullest.

After he passed in 2018, his wife, Shellie, told me, “Most scouts didn't last long. Charlie did, though, because he had a destiny.” Charlie was awarded the Air Medal First through Thirty-Second Oak Leaf Cluster, the Bronze Star for Meritorious Achievement in Ground Operations Against Hostile Forces, the Silver Star for Gallantry in Action, and a Purple Heart for wounds received in action. After Vietnam, he transferred to Germany, where he flew and commanded 300 troops as the operations captain. When he left the army after sixty-six months of military service, he joined the Sunnyvale Department of Public Safety in Sunnyvale, California, as a police and fire lieutenant.

Just like Charlie was never afraid to face adversities with his unlimited courage, he was not afraid to face his inner difficulties and struggles, and to surrender to change. Over the years, Charlie and Shellie became part of our family and even met my mother and siblings in Israel.

I could write a book about Charlie and his journey during the years we spent together. As part of his healing journey, he attended my meditation and healing evenings and retreats, and meditated on a daily basis. Our connection was a deep heart-to-heart connection. When I was in town and able to do healing sessions for him once or twice a week, the markers of his prostate cancer would decrease remarkably. And when I left for my long retreats or travels, and our healing sessions were put on hold, his PSA would rise. This cycle happened repeatedly, demonstrating his unique ability to take in healing all the way to the cellular level, which allowed him to outlive his disease by more than a decade.

Charlie's big transformation happened during a short weekend retreat at Amitabha Medical Clinic in 2012. At that time, I was teaching how past actions, even those of our ancestors, can affect our present experience and our current health, as can be demonstrated by our genetics and epigenetics. During the retreat, we engaged in a Buddhist meditation practice called *Tonglen*—a practice of exchanging suffering and difficulty for love and compassion. In the retreat, we discussed how this can help clear old traumas and heal us and those around us.

Charlie, in his unique way, dove into it full force. That night, while sleeping, he experienced all the difficulties and traumas he had undergone throughout his life: as a child growing up and as a Vietnam pilot repeatedly shot down. In his sleep, he was able to look into the eyes of those he had crossed in combat, but instead of experiencing his usual PTSD reaction, he

was able to send them love and compassion from his heart as a stream of white light. Charlie's heart was transforming his survival response, and with it, his trauma began to transform as well.

At that time, Charlie was experiencing severe pelvic pains due to bone metastasis. When he woke up the next morning, his pain was completely gone. And it didn't come back for a very long time, until years later, after a medical procedure caused unexpected side effects.

Tonglen practice became Charlie's main meditation. And with it, he became softer, his heart expanded, and his love and compassion for everyone became more and more evident. In our healing sessions, he could visualize his adversaries in Vietnam, and instead of having a survival-driven traumatic response, his heart would open, and he would continue to send white healing light to them.

When Charlie first met my mother at the clinic in 2006, he told her, "Ruth, Isaac teaches us how to live. And he also teaches us how to die." In the thirteen years I knew him, he lived a remarkable life, despite first coming to me with stage 4 cancer. And in his transition, he showed us all what it meant to die gracefully.

In April 2018, as Charlie's time was coming close, I would drive to his house in the evenings to offer acupuncture and healing. Charlie asked that I be at his side when he took his last breath. It was my promise and commitment to him. The evening before he died, I called him from the car as I was driving to his house to ask how he was feeling and how the day went. He replied by asking me, "How are your daughters doing? I was practicing *Tonglen* for them and sending them white light all day long." This is where his heart and mind were, even as he was transitioning. So vast was his care for others that instead of fixating on his own suffering, there was

only love left in his being and a profound sense of peace around him.

On that last evening, I left the clinic in the late afternoon and drove the hour to his house. Charlie was waiting for me, ready to make his transition, with Shellie hugging him at his side. I prepared for my meditation with him, our most important joint meditation. As we meditated and Charlie took his last breath, the sun rays came in through the window, and a rainbow shined on Charlie and Shellie. A graceful and amazing human being with the kindest heart left us in the most peaceful and inspiring way, showing us the power of transforming the survival paradox in life and in death—how the heart of survival holds the potential for profound transformation.

CHANGE BEGINS IN THE HEART

There is abundant research showing that happiness and compassion affect the nervous and circulatory systems, immunity, and much more.²¹ The more our hearts and minds can understand that we are part of a bigger collective, the happier and healthier we will be as individuals.

Every human being on this planet is in the same boat: we all want to be happy, but we experience difficulty and pain as part of our existence on this earth. One of the causes of our difficulties, of our inner suffering, is our inability to recognize that everything is changeable in its nature, and nothing is permanent. Instead of embracing this concept, we resist and fight change. If we'd stop resisting, our survival response would fall away, and with it, many of our difficulties, struggles, and illnesses.

When we realize that our survival as individuals and as a society depends upon opening our hearts to one another, everything can change. It is the essence of our heart and its physiological function. This is the profound

healing potential of opening our hearts and is one of the key messages of this book. When we understand the dangers of grasping for survival, we can see just how isolating and damaging it can be in the long run. My intention is to encourage and create a renewed emphasis on love and compassion. This also means being loving and compassionate *with ourselves*.

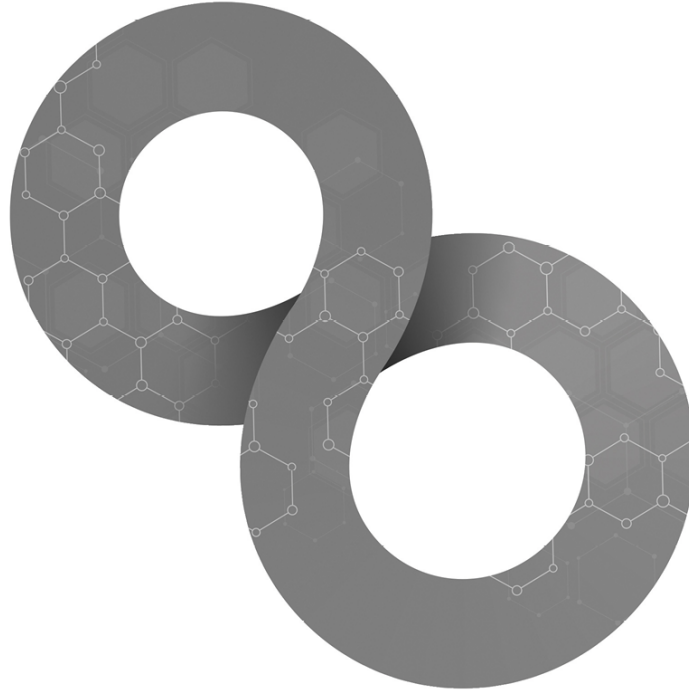
Love and compassion offer infinite healing capacity and allow us to overcome our survival reactions. When we are driven by our survival response, it expresses itself in the form of negative and harmful emotions, but that's not what the heart does. The heart takes whatever comes, and it doesn't fight; it transforms what it gets through its connection with the universe by utilizing the lungs and offers it back in return unconditionally. Recognizing and experiencing the innate, transformative action of the heart is one of the secrets to true happiness, health, and longevity.

²⁰ Rollin McCraty, "New Frontiers in Heart Rate Variability and Social Coherence Research: Techniques, Technologies, and Implications for Improving Group Dynamics and Outcomes," *Frontiers in Public Health* 5 (2017), <https://doi.org/10.3389/fpubh.2017.00267>.

²¹ C. Robert Cloninger and Ada H. Zohar, "Personality and the Perception of Health and Happiness," *Journal of Affective Disorders* 128, no. 1–2 (2011): 24–32, <https://doi.org/10.1016/j.jad.2010.06.012>.

Dariush Dfarhud, Maryam Malmir, and Mohammad Khanahmadi, "Happiness and Health: The Biological Factors—Systematic Review Article," *Iranian Journal of Public Health* 43, no. 11 (2014): 1468–77, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4449495/>.

PART TWO



A CLOSER LOOK AT THE SURVIVAL RESPONSE'S ROLE IN MAJOR CONDITIONS

CHAPTER SEVEN

CANCER

Since my medical career is centered around seeing cancer patients, I want to offer a multidimensional view of this topic. This chapter is my attempt to condense what I've learned from thirty years of experience in integrative oncology and Western and Chinese medicine. We'll paint a new picture from an educational and therapeutic point of view so we can better understand cancer, and share different aspects of the disease that are influenced by physical, chemical, psychological, emotional, and psychospiritual factors.

We all have encountered cancer, whether personally or through someone we know. The more we can view cancer in a multidimensional way, the more refined our treatments and approaches will be. I can't dedicate enough pages in this book to the many specific treatments and strategies that I utilize for cancer, so this section will focus on the deeper relationship between survival and cancer, which is a vital aspect of a truly holistic approach to cancer treatment.

There are many different therapeutic approaches when it comes to treating cancer, and despite what we have been told, we are never stuck with just one treatment method. Cancer is a dynamic condition that changes over time; therefore, we always have to adjust and change treatments or try something new. This is an important point to remember, and it's almost universally overlooked.

For example, when a treatment is working, it may be best to change it before the cancer develops resistance to it. Changing treatment does not necessarily mean stopping it; sometimes we can simply modify supportive, integrative therapies and change the environment around the cancer to prevent resistance. By taking this dynamic, creative, individualized approach, we are able to lengthen the time of response to a specific treatment.

Because each case of cancer development and treatment is individualized, this chapter focuses predominantly on patient stories. Between the stories are various sections on the nature of cancer, the body's response to it, and current treatment possibilities. When we apply a variety of therapies—dynamically and in a personalized strategy—it is quite amazing to see how a course of three to four different treatments can suddenly add years to a patient's life. My aim is to give cancer patients the opportunity to do more than just overcome cancer—we want them to *heal and transform* their lives.

HOW CANCER DEVELOPS

Even though we hear about cancer constantly and have friends and loved ones who have been affected by it, many of us still don't understand what it actually is. What is a cancer cell? What makes a cell turn into a cancerous one, and can we prevent this process from happening? In simple terms, cancer is the uncontrolled growth and spreading of abnormal cells. A cancer cell is one that starts to function on its own—it's no longer regulated by the body.

As we've discussed throughout the book, we are driven by survival, and in the case of cancer, the specific cell shifts from serving a function as part

of a larger whole to focusing solely on its own independent survival. This abnormal survival response can be caused by numerous factors.

Previously, conventional medicine focused on mutations as the cause of cancer and emphasized the genetic component, but today, we know there are a great array of reasons and processes that can lead to such a shift. Epigenetics, environment, lifestyle, diet, and other factors can also play a role. These triggers can initiate a shift in the metabolism of the cell, which allows it to survive as an independent entity. If we can stop the survival response of the cell, we can reverse this process—preventing the cancer from occurring.

According to the American Cancer Society, nearly 50 percent of cancer cases in the United States are preventable—they are caused by environmental stressors and lifestyle choices.²² Such factors can trigger or fuel the survival response. But when we are able to control this response, we can control the inflammation and metabolic changes that drive cancer. This allows us not only to positively impact cancer treatments but even stop cancer before it starts.

Knowing that multiple factors can cause the development of cancer, we have to take them into consideration if we want to design and develop an effective treatment strategy. A key component of stopping cancer growth and implementing therapeutic strategy is understanding the metabolic changes the cell undergoes when it becomes cancerous. The most important of these is the *Warburg effect*. This is when cancer cells create a hypoxic environment—even in the presence of oxygen. The cancer cell uses the metabolic shift for a number of survival mechanisms. I'll focus on the two most important ones: first, the metabolic shift inhibits programmed cell death (*apoptosis*), meaning your cells don't complete their life cycle as

they're supposed to; second, the shift activates the ability of the cells to create new blood vessels (*angiogenesis*).

These processes allow the primary tumor to grow and metastasize rapidly and give the cancer the ability to manipulate its environment. All of these are consequences of the survival response of the individual cell: it changes its metabolism to address the crisis, blocks apoptosis to avoid death, creates angiogenesis to allow for additional blood supply, evades the immune system, and creates a favorable environment for cancer growth.

Cancer doesn't develop overnight. It begins with a process called *dysregulation*, which is a disruption in the communication system of the cells. There is still dialogue between the cell and the body, but it's not as straightforward or direct as the communication between normal cells.

Imagine these out-of-control cells like wild children who don't listen to their parents—they're rebels. A stomach cell may no longer want to fulfill its role in the stomach, and a brain cell may no longer want to fulfill its function in the brain. The cell wants to survive at any cost, and it no longer recognizes that its life cycle includes death. It doesn't recognize its natural environment as a safe and friendly place, and this triggers a survival response. As a result, it isolates itself from the rest of the body by creating a protective microenvironment, or a "shell."

When a cell is isolated, it no longer has proper communication with other cells and no longer sees itself as part of a larger community. It goes rogue and begins to obtain its own blood supply and nutrition. It starts to grow independently and rapidly, even if it has to use alternate metabolic pathways. It's as though it refuses to listen to other cells, decides it's going to be in charge of itself, and takes control over its survival. These rogue cells become more aggressive and attack the host, eventually spreading

throughout the body.

REESTABLISHING A NORMAL ENVIRONMENT

Each stage of cancer development is influenced by galectin-3. When we contain or control galectin-3 and its damaging effects, we reestablish a normal environment. When we do that, we can reduce the aggressiveness of the cancer, and the cancer cells have a greater chance of normalizing. I've seen changes in cancer metabolism over time, where the cancer becomes less aggressive and begins to function more like a normal cell. Let me explain this by picking one specific example.

Our cells have a specific gene that creates a protein in charge of suppressing cancer. This gene is called *P53* and is known as the “guardian of the genome.” It stands ready to protect the cell from turning into a cancer cell. When expressed at sufficient levels, *P53* will regulate the cell and prevent cancer, and the cells will naturally die on time in the process of apoptosis.

When galectin-3 attaches to certain receptors on the cell membrane as part of the survival response, it reduces *P53*. As a result, cell growth and cancer-promoting proteins in the cell are activated, and the cell goes into crisis mode. This initiates a cascade of events that can result in cancer. Moreover, the more suppressed the *P53*, the more aggressive the crisis mode can be, resulting in a hyperinflammatory state, a greater shift to aerobic glycolysis (the Warburg effect), and to a more aggressive cancer.

As more galectin-3 binds to the surface of the cell, it triggers angiogenesis, and the resulting new vessels supply blood that promotes the growth of the cancer and eventually the metastatic process. Blocking galectin-3 and preventing *P53* suppression can prevent all of this from

happening. In existing cancer, such strategies can reduce the cancer's aggressiveness and enhance the response to treatment.

Epigenetics and Cancer

A growing field in the study of cancer is *cancer epigenetics*. As I've discussed, the field of epigenetics investigates certain tendencies we inherit from previous generations as a result of their exposure to lifestyle and environmental factors. These factors—such as unhealthy diet, profound emotional stress, or erratic sleep habits—affect gene expression and aggravate cancer. But, crucially, such tendencies can be reversed through lifestyle, supplement programs, and other modalities.

HEALING THE STORY BEHIND THE CANCER

Treating cancer and its effects is only part of an integrated approach. We must also treat its roots. We've touched on the fact that there can be different causes for a cell or tissue to go into survival mode, like genetic and epigenetic influences, or multiple events and traumas in our lives. In my medical practice, I make it a point to explore these in greater detail, especially when it comes to cancer.

Unusual cancers have unusual stories. From the perspective of Chinese medicine, the survival response can vary based on the specific location of the cancer and what the diseased organ symbolizes emotionally and psychologically.

I often revert to my meditation practice as a source of insight when I am preparing to see a new patient and explore some of their hidden stories. To utilize deep insight into their story as a healing opportunity, I follow a basic principle: I recognize that this is *their* story and *their* trauma. They need to be the one to discover and transform it.

I never suggest that something happened to a patient. I ask several generalized questions and provide an opening for their story to arise and reveal itself. For example, I often look for the place in a patient's life or history where they felt they couldn't take a deep breath. Frequently, the survival response accompanies the event where the patient couldn't breathe, either literally or figuratively.

These kinds of recognitions can serve as an opportunity for profound healing, as they allow the traumatic pattern that triggered the survival response to unwind. Then, in addition to guiding patients through their conventional care, I support their healing and transformation with acupuncture, specific injections if needed, guided visualizations, and hands-on healing.



MARY'S STORY

Mary was a forty-year-old woman from the East Coast who was diagnosed with adenocarcinoma of the adrenals, a very rare and difficult-to-treat cancer that had already metastasized to the liver. The prognosis of such cancer is poor, and the chemical ablation of the adrenals that is used to treat the condition can have awful and lifelong side effects. Mary lived a very healthy lifestyle, so this diagnosis came as a shock to her.

As I sat in my cabin in the woods and meditated on Mary's upcoming first visit, I saw an image of a dog that she loved when she was eight or nine years old. I felt that something related to this dog caused a deep trauma in Mary that had registered deep in her body. In Chinese medicine,

the adrenal gland is often related to deep fear or shock, and the adrenaline response is initiated there. For something from so early in her life to have an impact so many years later, it had to have been a profound trauma.

When Mary came for her first visit, I asked her if she had any pets when she was a child, perhaps between the ages of eight and ten. Mary replied that she never had pets. However, a few minutes later, she turned to me and said she remembered she had a dog she loved when she was nine. I asked her what happened to it, and she said that her parents gave it away.

“How did you feel about that?” I asked.

“I tried to commit suicide.” She replied as if it were a casual thing. “They rushed me to the hospital, and they were able to save me.”

We both sat there in total silence for what seemed like an eternity. Mary stared off into space as though recalling a long-forgotten memory. Slowly, she looked at me, tears rolling down her cheeks. In that moment, Mary was able to connect with her trauma and initiate a deep healing process. She returned to the East Coast, where she engaged in holistic treatment methods with great success.

OPTIMIZING CANCER TREATMENTS

There are two paths we can take when we begin to treat cancer. The first is to solely rely on standardized oncological treatments. The second is to develop a deeper understanding of the human body, how we interact with the cancer, and how we as individuals can participate in our own healing journey. I recommend a combination of the two. We should use conventional medicine and research as a roadmap to guide us through treatment, and at the same time, we need to understand how and why a particular treatment may or may not be effective. We also need to consider

how we can make conventional treatments more effective and less toxic.

When it comes to conventional cancer treatments, it doesn't matter who is administering the chemotherapy. The treatment selection is based on statistical outcome. Integrative medicine, however, when practiced in a holistic way, focuses on *changing the expected outcome*. It improves the treatment and reduces the side effects, while recognizing the individuality and uniqueness of each person. For some patients, the benefits may be minimal. For others, the benefits are miraculous.

I've observed in my medical practice, with almost no exceptions, that patients who embark on this holistic path have better outcomes. This healing approach is truly an art, because each person is on their own healing journey. Each patient has an amazing story. My role as healthcare practitioner and healer is simply to allow the story to unfold.



JOHN'S STORY

I will never forget John, a forty-five-year-old man with terminal leukemia. John went into cardiac arrest during the chemotherapeutic attempt to induce a remission, and was sent home with a life expectancy of days, perhaps two to three weeks at best.

John lived in rural California and barely made a living from growing and selling pot. He had lived an unhealthy lifestyle for years, with very little motivation, if any, to live a healthy, productive, and meaningful life. He came to my clinic with his two siblings who were completely different from him. Both had PhDs in clinical psychology and were highly motivated to

live healthy lives—they wanted to help transform their brother's health. They were well read on alternative strategies, as there were no conventional treatments available for John any longer.

A good doctor needs to listen and learn from their patients, and John's siblings sure taught me a lot that day as they shared their insights with me. John stated that he wanted to live, but in my initial assessment, I couldn't see such a miracle unfolding. I didn't see any room or deep will within him for change. What I had failed to recognize was the power of his support system and the unconditional love of his siblings. They moved John into their home, far away from his disruptive and unhealthy environment. They transformed his lifestyle and diet and put him on an intense program of herbs and supplements—a combination of their research and my fine-tuning.

John's days included meditation, qigong, exercise, yoga, and a loving environment free from judgment or expectations. And the outcome? John went into full remission, and there was no longer any sign of his disease.

A few months after his remission, John decided to return to his rural community. He was convinced that his initial diagnosis was probably a mistake, and he didn't have to continue his new lifestyle. Despite my warnings and the heartfelt requests of his siblings, he reverted to his old habits.

Three months later, John showed up at my clinic with another recurrence of his leukemia and asked if I could help him again. I told him that we could try, knowing that miracles don't repeat themselves easily. Unfortunately, the disease took over this time, and John died a few weeks later.

John's journey demonstrates in a vivid and unparalleled way the

miraculous power of change and transformation, while exhibiting how the power of our habits and unhealthy lifestyle always challenge us in the healing journey. But above all else, John's journey taught me what the power of unconditional love and community support can do. Together, these were able to completely dissolve and transform the survival paradox.



LINDA'S STORY

A patient's priorities in life completely change the moment they are diagnosed with cancer. What was important even a moment before their diagnosis may no longer be of any importance the moment after. As preparation for my initial visit with my cancer patients, I ask them to prepare their prediagnosis priority list and a list of what became a priority after the diagnosis. I also ask them to prepare a wish list of priorities—the things they want to do if they completely heal from cancer. Just creating a priority list can have a transformative, healing effect.

Healing doesn't always equate to eliminating cancer. We can go through a profound healing transformation yet still die from cancer. Linda's story is one that exemplifies this.

Linda was a successful, fifty-year-old accountant who came to see me fifteen years ago with advanced stage 4 ovarian cancer that failed to respond to multiple chemotherapy regimens. She was given very little hope before her last possible round of chemotherapy, so she decided to take some time to better understand the disease (and herself) before starting the next round of treatments.

During our initial visit, we explored Linda's life journey that led to her cancer and how it could be changed. I asked her what she would do differently—how her priorities would shift—if her cancer disappeared and she completely healed. We had a deep heart-to-heart connection during the visit, so I was quite surprised when she disappeared and didn't come back for a follow-up. She finally came back six months later.

I asked Linda what had transpired over the past six months, and she said that she took time to contemplate the answer to the question I had asked her: what would she do differently if she was completely healed? As a result of her deep reflection, she quit her job as a CPA, and she began doing art and writing poetry. She took daily walks in nature and found a supportive community of female friends. Her struggles and survival mode had melted away, and she had transformed into a different person.

Linda glowed, and her open heart and immense kindness were so evident. With this shift, Linda had an unexpected response to her chemotherapy. Supported by a sophisticated supplement program, occasional high doses of intravenous (IV) vitamin C, and ongoing healing sessions with me, she outlived her disease by years.

As part of her transformation, Linda felt that mountain lions were her protective animal, and she had a special affinity for them in her drawings. When her disease progressed (much later than expected), Linda felt that just as she had transformed in her life, she was ready to transform in the way she left this world. She told her best friend two days before her death that she was about to die, and that after she died, a mountain lion would show up as a sign from her.

Two days after she had talked with her friend, Linda came home from a yoga class, sat on her bed, and left her body. The next morning, her friend

drove along the highway and a mountain lion ran down from the mountains. It ran next to her car for miles and then returned to the mountains. Linda was fine, and she had given us a profound teaching through her life and death process.

INTERDEPENDENT THERAPEUTIC STRATEGIES

The classic cancer treatments are surgery, chemotherapy, radiation, hormonal therapy, and immunotherapy. In conventional oncology, some of these treatment modalities are given in a sequence. For example, in localized breast cancer, surgery is followed by radiation. And much too often, these treatments are viewed as separate and individual rather than interdependent therapies. Not only are the therapies interdependent, but each phase of treatment and the body's response are interdependent as well.

What do I mean by this? Let's take surgery and biopsy as an example—they are routinely performed for both diagnostic and therapeutic purposes. When the tissue attempts to repair itself post surgery, it quickly excretes galectin-3 as part of the repair process, resulting in a large increase in inflammatory and growth factors. This means that if there is any residual cancer in the body during tissue repair, it will grow much faster. This is something we actually see quite often and why it's so critical to use MCP before and after a biopsy or surgery. For my patients, the last thing they drink before the prebiopsy or surgery fast is ten grams of MCP (a high dose) mixed in water. It's also the first thing they consume when they can take in liquids post surgery.

There are different therapeutic strategies when it comes to treating cancer. We can try to fight and kill the cancer by using chemotherapy,

immunotherapy, and radiation; we can try to inhibit its growth by limiting its growth factors and blood supply; or we can try to redifferentiate the cancer cell to make it less aggressive and possibly convert it back to a normal functioning one. These strategies are often combined and adjusted based on the patient's condition and treatment timeline.

When we implement the first strategy and try to kill the cancer, it will attempt to evade treatments like chemotherapy, radiation, and immunotherapy. It does this by isolating itself and creating an altered microenvironment, and activating pumps that remove the chemotherapy drugs from the cancer cells. These pumps are called *Multiple Drug Resistance* (MDR) pumps, and they are located on the membrane of the cancer cells. By utilizing these pumps, the cancer cell can use energy through its surrounding microenvironment while pumping out the drugs that are meant to kill it. Integrative approaches attempt to block these pumps to overcome drug resistance and get better responses to chemotherapy.

Another example is radiation therapy. The microenvironment created by the cancer is low in oxygen, and radiation therapy depends on oxygen to kill cancer. By utilizing strategies from integrative medicine, we can improve the oxygen-poor hypoxic environment, improving the treatment outcome and reducing side effects. If we reduce inflammation, bring in an oxygen-rich blood supply, block galectin-3, and utilize dietary changes together with mitochondrial support, the cancer cells will become more radio-sensitive. They will be more easily killed by radiation therapy.

The second strategy in cancer treatment is inhibiting growth by limiting its blood supply and growth factors (the compounds that stimulate the growth of cells and tissue in the body). In conventional oncology, this is

done by using various pharmaceuticals that inhibit different growth factors. These treatments are extremely expensive and can be very toxic but can have a significant effect on slowing cancer growth.

When we look at cancer, the hypoxic environment created by the survival response stimulates growth factors and new blood supply. By normalizing the microenvironment and reducing the hypoxia, we can reduce the growth factors and new blood vessel growth, enhancing the benefits of these pharmaceuticals while reducing their inflammation-driven side effects.

This brings us to the third strategy, *redifferentiation* of the cancer cell, which is the process of normalizing abnormal cell function. When we try to redifferentiate cells, we can use certain agents to move the body from a survival-induced stress state to a relaxed one. While there are many ways to redifferentiate cells, the key is to *create the shift*. The cells need to shift away from survival so the galectin-3 lattice formation falls away.

While we can do this by using a number of compounds and strategies as mentioned throughout the chapter, it's worth noting that whenever we shift from a state of panic, stress, and anxiety to a state of greater calm, peace, and harmony, this sends a direct signal to our body to do the same, all the way to the cellular level. As feelings of self-isolation fade away and the alarm from the survival response turns off, the protective microenvironment surrounding the cancer can also begin to unravel.

PAIRING TREATMENT WITH DRUG HALF-LIFE

In the clinic, I modify my programs (including dietary guidelines) based on the conventional treatments that patients are receiving. I take into consideration the specific drugs or treatment methods used, and the *half-life* of the drugs. The half-life, or $T_{1/2}$, is defined as the time it takes for the concentration of a drug in the

plasma or the body to be reduced by 50 percent.

When timing a dietary regimen with certain chemotherapy drugs, we want to shift the mitochondrial metabolism while the effect of the drug is at its peak in the body. We can do this by combining prolonged intermittent fasting with a calorie-restricted ketogenic diet, together with the use of honokiol—an active anticancer compound from Magnolia bark (see Appendix B). This strategy should be timed around the chemotherapy, making sure that the effects of this protocol are optimized during the first three half-lives of the chemotherapy drug. The length of the regimen will therefore vary based on the half-life of the specific drug the patient is taking at the time.



JOSEPH'S STORY

Occasionally, we have the opportunity to document redifferentiation of cancer. We were able to do so with Joseph, a sixty-two-year-old business executive who had been diagnosed with an aggressive Gleason 9 prostate cancer. The Gleason score categorizes prostate cancer based on its aggressiveness, as reflected by the differentiation of the cancer: the more differentiated the cancer cells, the closer they are to normal cells, and the less aggressive they are. A well-differentiated cancer with the lowest aggressiveness has a score of Gleason 6, and the most aggressive, undifferentiated prostate cancer has a score of Gleason 10.

The outcome and survival rate are dramatically different between the two scores. Gleason 6 prostate cancer is often simply observed and doesn't require treatment, while a Gleason 10 prostate cancer is lethal and requires aggressive treatment. At Gleason 9, Joseph's cancer was very aggressive.

Aware of the severity of his situation, Joseph came to see me for a consult prior to scheduling surgery. At the time of diagnosis, he was under great stress—not only was he facing cancer, but his long-term business, toward which he had put years of his life, was failing. Knowing that we had just a few weeks between his diagnostic biopsy and surgery to remove his tumor, I designed a multifaceted program for him. Joseph engaged in an intense detoxification and healing regimen that included lifestyle changes, stress management, significant dietary changes, a comprehensive supplement program, intravenous therapies, and acupuncture and healing sessions. During these weeks, I watched him transform: he became happier and more relaxed, and his physical health, stamina, and well-being markedly improved.

Joseph had his surgery six weeks after starting this program, and to his surprise, his post-surgery Gleason score was reduced to a 7, reflecting significant redifferentiation of his cancer. While this may seem like a mere change in numbers, for the Gleason score to decrease so significantly in the short time between biopsy and surgery is extremely rare. For Joseph, this meant a very different prognosis and a much better outcome.

I have repeatedly seen Gleason scores improve between biopsy and surgery with the use of programs such as Joseph's. The results exemplify the potential and power of addressing a cancer pattern before undergoing conventional medical treatments, allowing the cancer to redifferentiate—to shift its nature and expression.

DIETARY GUIDELINES IN CANCER

The cancer cell is an impatient cell, using glycolysis exclusively through the Warburg effect to produce energy very quickly, creating a vicious, self-

perpetuating cycle. The more glucose-dependent a cancer cell is, and the more sugar it consumes, the more inflamed and aggressive it will be. When we consume glucose, we feed cancer and its pathways. Using a low-glycemic index diet that is generally low in carbohydrates is a basic strategy that helps to shift the cell away from survival mode and make it more responsive to treatment.

Another dietary strategy that is now very popular is intermittent fasting. There are different methods, but the ultimate purpose is the depletion of glucose stores, which results in lower insulin levels and allows the body's metabolism to shift into a healthier mode. The ketogenic diet has an impact similar to that of intermittent fasting, but since it's an alternate diet, I don't recommend it for continuous long-term use. I will explore the ketogenic diet more in a later chapter, but I want to discuss it briefly here as well since so many of my cancer patients ask me whether it might be right for them.

Although the ketogenic diet and intermittent fasting share some similar features, they are not the same. Intermittent fasting promotes a metabolic process called *autophagy*, which allows cells to do internal cleanup, shift away from problematic pathways, and upgrade their mitochondrial function. During intermittent fasting, the cell returns to its normal energy production system, which is how a cell functions when it's not under threat and not in survival mode. This is unlike the process of ketosis, which is a long-term survival response—and therefore still a survival response—that relies on an alternate energy. For more information on intermittent fasting, please refer to the “diets” section of Appendix C.



ELLEN'S STORY

Ellen was a remarkable fifty-five-year-old family physician who was diagnosed with very aggressive myosarcoma (cancer of the muscles) that had metastasized to the spine and the liver. Her tumor was extremely inflamed, and her PET/CT scan showed an abnormally high glucose uptake, meaning the cancer was using large amounts of glucose to produce energy. This was evident in the Standard Uptake Value (SUV) reading of the scan, a value that quantifies the level of glucose metabolism in a cancer cell. She no longer responded to chemotherapy and was deemed a terminal patient.

As a last resort, Ellen flew from the East Coast to see me. Recognizing the metabolic characteristics of her tumor, we focused on shifting her metabolism by combining MCP with Honokiol, together with therapeutic apheresis and other treatment modalities. Combined with an easier-to-tolerate chemotherapy regimen from a local oncologist, Ellen had a remarkable response. Her tumors shrunk, and she lived much longer than expected.

THERAPEUTIC APHERESIS—A KEY TO DISARMING GALECTIN-

3

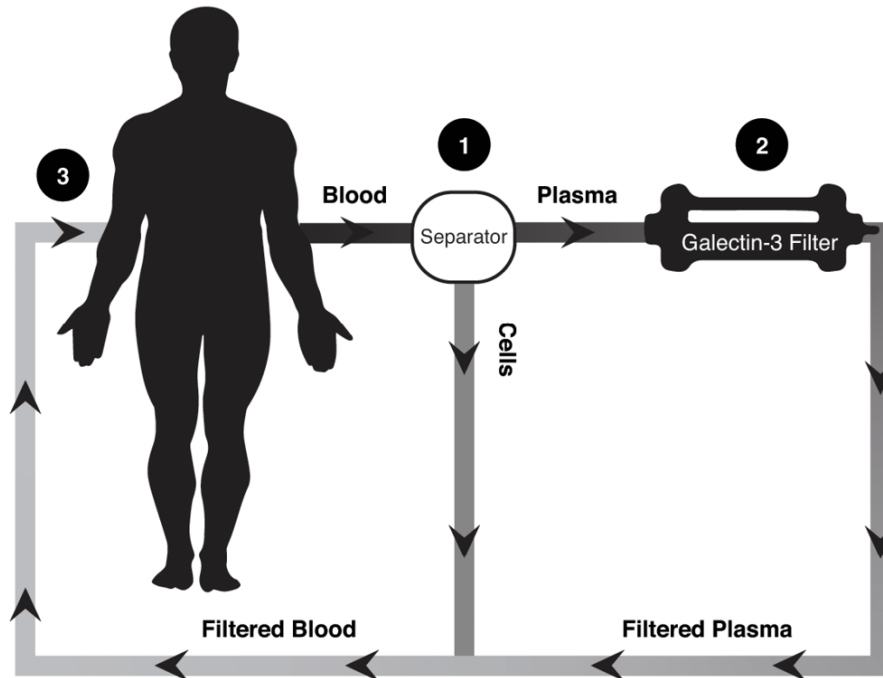
In 2011, I had an insight. Since galectin-3 is particularly damaging when it's in the circulation and the extracellular matrix, I wondered what would happen if it were removed from the bloodstream. And what would happen if other inflammatory compounds could be removed as well? This insight led to the development of

galectin-3 therapeutic apheresis.

Therapeutic apheresis is a procedure similar to dialysis but different in that only the plasma, the noncellular part of the blood, is filtered. Blood is drawn from a vein, and the cells are separated from the plasma. The plasma then circulates through a specific filtration column that removes galectin-3, along with oxidative, inflammatory, and cancer-promoting compounds that are part of the galectin-3 lattice formation. (In Ellen's case, we removed inflammatory compounds, a small amount of galectin-3, and different growth factors.) The filtered plasma is then reintegrated with the cells, and the filtered blood is returned through a different vein.

For quite a few years now, I have been working on the removal of galectin-3 from the plasma. Therapeutic apheresis is the most powerful and direct approach to removing galectin-3 from the body. My team and I have developed a specific filtration column that's been proven effective, and we hope to begin clinical trials soon. This device holds promise as a powerful tool that will save many lives. Our initial focus is on sepsis and Acute Kidney Injury (AKI), Chronic Kidney Disease (CKD), potentiation of immunotherapy in cancer, and the treatment of NASH (nonalcoholic steatohepatitis disease).

Apheresis Blood Filtration Process



Blood is filtered and returned to the body.

Knowing that this unique therapeutic approach can make a significant difference and save the lives of so many people, it is my true hope that we will be able to bring it to fruition. This is all part of my life's work to help us heal ourselves, our communities, and our world by removing and preventing what isolates us—whether from within or without.

HORMONAL REGULATION

When treating cancer, it's important to regulate the hormonal environment. An abnormal hormonal environment can stimulate hormone-sensitive cancers, such as breast, ovarian, uterine, and prostate. Other types of cancers such as brain glioblastomas, pharyngeal, thyroid, lung, and colon cancers can have hormonal receptors as well.

The hormonal levels in our body rise and fall in a rhythmic fashion. Understanding the circadian rhythm of hormones and their effect on both body and cancer provides a powerful tool for enhancing different cancer therapies. Throughout my career, I have watched the lives of many of my patients extend significantly by modifying treatments according to this understanding. The guiding principle is recognizing the individuality of each person and their unique internal rhythm and hormonal expression. Often, subtle adjustments in the hormonal expression of the body can influence the cancer. As a result, the patient can respond to a treatment that they have stopped responding to.

When I say, “regulate the hormonal environment,” I’m not just talking about the level of hormones but also about creating the right hormonal metabolites (the by-products of hormones after they’ve been processed in the body). The liver plays a large role in harmonizing hormonal metabolites and can influence whether they become cancer-inhibiting or cancer-promoting. We’ll discuss more about the liver in an upcoming chapter.

Cancer Patients “Don’t Have the Time”

Cancer patients are often warned to avoid sick people so they don’t catch a cold, etc. However, it’s very uncommon for someone with cancer to catch a cold. I have rarely seen it happen. Why is that? It’s because the body doesn’t have the resources to fight a cold. The body is focused on fighting the cancer and often will not manifest the immune response that creates the symptoms of a cold. When a person is fighting for their life, they don’t have time to deal with detoxification or superficial issues; these minor illnesses are not high on the priority list.

Oftentimes, when a cancer patient gets better, they will finally catch a cold, or they will have sudden tooth pain because a dental problem has the

opportunity to arise. The body can shift priorities and address problems that have been put on the back burner. This is all part of the repair process and is a good indication that the immune system is now acting and reacting in a normal, proper way. Since the cancer has been dealt with, the person can now deal with other, less urgent health issues that the body had to set aside.

MONITORING CANCER

An essential component of cancer treatment strategy is finding ways to monitor the disease. In my practice, I follow up with different cancer and inflammation markers and growth factors. When I can match laboratory changes with clinical changes, these markers can be used to gauge the patient's progress and identify changes before they are detected in a scan.

There are, however, even more subtle tools that can identify changes before they are reflected in our biochemistry and physiology. A specific tool that I rely on and have been refining over decades is *Chinese pulse diagnosis*, a key diagnostic method in Chinese medicine that allows me to identify changes in both the person and the cancer before they manifest on the physical level.

At the beginning of the chapter, I referred to the important strategy of making changes in treatment while the treatment is still working, *before* the cancer develops resistance. A treatment may be working on the physical level but on the more subtle energetic level, resistance may start to develop, and in that case, if nothing is done, the treatment will stop working. Identifying such a change early on through pulse diagnosis can delay or even prevent the resistance from happening.

Returning to the relationship between a cancer marker and the cancer, let's look at prostate cancer as an example. We can examine a specific stage

of prostate cancer recurrence called *Biochemical Recurrence of Prostate Cancer* (BRPC). This occurs in prostate cancer patients who originally had a localized disease that was treated locally: their prostate and its cancer were completely removed through surgery, radiation, or both. As a result, their Prostate-Specific Antigen (PSA)—a protein produced by both normal and cancerous prostate cells and regularly used as a marker in prostate cancer patients—becomes undetectable. This signifies that there is no longer any normal prostate tissue or prostate cancer left.

If a patient's PSA levels start to rise again, that indicates a recurrence of the cancer. Since the prostate has been removed, any rise in PSA can only be produced by the prostate cancer cells. In some cases, it's only a biochemical recurrence, while for others, we can already see a local recurrence in scans. In both cases, the expectation is for the cancer to grow and progress, and eventually metastasize if not treated.

We can quantify the growth rate of the cancer by the rate of increase in PSA. This is called PSA *velocity*, and is calculated through the PSA Doubling Time (PSADT), which is how long it takes the PSA levels to double. The faster the PSA doubles, the quicker the cancer grows and the more aggressive it becomes. For these patients, the PSADT is a very accurate measurement of cancer progression.

My colleagues and I conducted three studies in this category of patients with BRPC using MCP, with the last study being a multicenter study conducted with sixty patients. All three studies showed similar results: 75 to 80 percent of the patients exhibited improvement in their PSADT, with the rise in PSA either slowing down or stopping completely.²³ Based on this marker, we could determine that the growth of the cancer had either slowed down or stopped altogether. These effects were observed to last for

years.

The BRPC reflects a situation similar to that of newly diagnosed prostate cancer. However, since the cancer has *reoccurred*, the prognosis is not as favorable as it is in early stage prostate cancer. When we start the MCP early enough, it allows the body's own immune system and healing capacity to overcome the cancer or slow its growth. We've seen prostate cancer patients benefiting from MCP for many years now.

Multiple studies have demonstrated the synergistic effects of MCP with different cancer treatments—MCP exposes cancer and reduces inflammation, hypoxia, and the cancer-promoting environment around the cell.²⁴ It breaks the lattice formation and removes the inflammatory compounds and immune evaders that bind to galectin-3; it reveals the cancer cell to the immune system and enhances the response to different treatments.

FINAL THOUGHTS ON HEALING AND OVERCOMING CANCER

We live in a world full of details. We do research, report the findings, and then implement what we've learned. However, we seem to have lost the ability to see the big picture and the dynamic interdependence of everything—both within the body and outside of the body. If we take the time as doctors, patients, healers, and human beings to look at the big picture, then treatments become more refined and more powerful at the same time. Why is that? Because we have better alignment between the big picture and the small details.

When we look at the big picture, we can better understand how treatments work together, rather than compartmentalizing them. It also

gives us the ability to administer treatment on a case-by-case, patient-by-patient basis. We can look at each person as a whole—their age, their season of life, their goals for life and survival, and treat them based on their desired outcomes.

This book is not a cancer treatment book. As such, I could only touch on principles of integrative treatments and key strategies. I will present some of the beneficial compounds for cancer in greater detail in Appendix D, but it's important to note that in truly holistic and individualized care, there are no predetermined recipes or prescriptions.

In this chapter, I've offered my approach to life, medicine, and cancer treatment. I want to encourage a different way of thinking and understanding. Each of us—whether we are facing cancer, or supporting a loved one—should consider how to best apply these guidelines. We never know in advance what will help a specific person, and the more profound our understanding of individual uniqueness, the easier it is to make a difference.

²² Elizabeth Mendes, “More than 4 in 10 Cancers and Cancer Deaths Linked to Modifiable Risk Factors,” American Cancer Society, November 21, 2017, <https://www.cancer.org/latest-news/more-than-4-in-10-cancers-and-cancer-deaths-linked-to-modifiable-risk-factors>.

Ann Goding Sauer, Rebecca L. Siegel, Ahmedin Jemal, and Stacey A. Fedewa, “Updated Review of Prevalence of Major Risk Factors and Use of Screening Tests for Cancer in the United States,” *Cancer Epidemiology Biomarkers & Prevention* 26, no. 8 (2017): 1192–1208, <https://doi.org/10.1158/1055-9965.epi-17-0219>.

²³ Daniel Keizman, Moshe A. Frenkel, Todd Michael Edwards, Eli Rosenbaum, David Margel, David Sarid, Victoria Neiman, et al., “Effect of PectaSol-C Modified Citrus Pectin (P-MCP) Treatment (Tx) on PSA Dynamics in Patients (Pts) with Nonmetastatic, Biochemically Relapsed Prostate Cancer (BRPC): Results of the Interim Analysis of a Prospective Phase II Study,” supplement, *Journal of Clinical Oncology* 35, no. 15 (2017), https://doi.org/10.1200/jco.2017.35.15_suppl.e16588.

²⁴ Sefora Conti, Akiva Vexler, Lior Hagoel, Lital Kalich-Philosoph, Benjamin W. Corn, Nir Honig, Natan Shtraus, et al., “Modified Citrus Pectin as a Potential Sensitizer for Radiotherapy in Prostate Cancer,” *Integrative Cancer Therapies* 17, no. 4 (2018): 1225–34, <https://doi.org/10.1177/1534735418790382>.

Ghamartaj Hossein, Sina Halvaei, Yassaman Heidarian, Zeinab Dehghani-Ghobadi, Mina Hassani,

Homa Hosseini, Nima Naderi, and Shahrzad Sheikh Hassani, "Pectasol-C Modified Citrus Pectin Targets Galectin-3-Induced STAT3 Activation and Synergize Paclitaxel Cytotoxic Effect on Ovarian Cancer Spheroids," *Cancer Medicine* 8, no. 9 (2019): 4315–29, <https://doi.org/10.1002/cam4.2334>.

Ghamartaj Hossein, Maryam Keshavarz, Samira Ahmadi, and Nima Naderi, "Synergistic Effects of PectaSol-C Modified Citrus Pectin an Inhibitor of Galectin-3 and Paclitaxel on Apoptosis of Human SKOV-3 Ovarian Cancer Cells," *Asian Pacific Journal of Cancer Prevention* 14, no. 12 (2013): 7561–68, <https://doi.org/10.7314/apjcp.2013.14.12.7561>.

Jiahua Jiang, Isaac Eliaz, and Daniel Sliva, "Synergistic and Additive Effects of Modified Citrus Pectin with Two Polybotanical Compounds, in the Suppression of Invasive Behavior of Human Breast and Prostate Cancer Cells," *Integrative Cancer Therapies* 12, no. 2 (2012): 145–52, <https://doi.org/10.1177/1534735412442369>.

Najmeh Tehranian, Houri Sepehri, Parvin Mehdipour, Firouzeh Biramijamal, Arash HosseinNezhad, Abdolfattah Sarrafnejad, and Ebrahim Hajizadeh, "Combination Effect of PectaSol and Doxorubicin on Viability, Cell Cycle Arrest and Apoptosis in DU-145 and LNCaP Prostate Cancer Cell Lines," *Cell Biology International* 36, no. 7 (2012): 601–610, <https://doi.org/10.1042/cbi20110309>.

CHAPTER EIGHT

HEART AND KIDNEY DISEASES

The unique link between the heart and kidneys has been recognized for millennia. An ancient Hebrew saying, loosely translated, states, “To judge a person as a whole, examine the kidneys and the heart.” From the perspective of Chinese medicine, the deepest aspect of the body, our core, lies in the connection between the heart and kidneys. It is often referred to as the “axis of water and fire,” with water relating to the kidneys and fire relating to the heart. In this chapter, we will discuss the deep physical, energetic, and philosophical relationship between these two organs, and the importance of understanding this relationship when assessing the person as a whole.

First, let’s examine this connection from a physiological point of view, drawing from both conventional and Chinese medicine. The heart and the kidneys are on opposite sides of the circulatory system, representing the beginning and end, while creating a continuous flow between the two. The heart starts the circulation of our clean, arterial blood, and the kidneys are the last organ to receive the same blood. The kidneys then filter the blood of waste products and return the blood back to the heart.

If someone has problems with the kidneys, it’s likely they will also have problems with the heart and vice versa. This is especially true in cases of chronic kidney disease (CKD). Heart disease is the most common cause of death among people with kidney disease because they both share the same

underlying pathology: thickening and hardening of the artery walls, known as arteriosclerosis. They also share the same causative factors: diabetes, hypertension, and lifestyle issues such as smoking, lack of exercise, and the Standard American Diet (SAD).

The role of galectin-3 in inflammation and fibrosis naturally impacts the function of the heart and the kidneys, as well as many of our vital organs. Galectin-3 has an influence on degenerative diseases that decrease the normal function of the heart, kidneys, lungs, and liver, resulting in chronic illness and even death.²⁵ We'll discuss the effects of galectin-3 on these four major organs over the next two chapters—focusing on the heart and kidneys presently, and on the liver and lungs in the next chapter—as well as therapeutic strategies.

THE HEART

From a conventional medical perspective, the heart is an ongoing pump. But when we take a more holistic view of the heart, we realize that it's much more.

The heart is an awe-inspiring organ. In many ancient medical systems, it's considered to be the “emperor” or “king” of the body because it nourishes the body as a whole—it's the ultimate giver. As we discussed earlier, the heart is fundamentally different from any other organ. The rest of the body receives clean, oxygenated, arterial blood, and in return excretes unwanted by-products into the circulation or the venous system. The heart is unique because it's the only organ that *receives* dirty blood. And no matter how dirty the blood is or where it came from, the heart will clear the dirty blood and provide clean blood to the body.

As such, the heart is the ultimate transformative organ. It takes in

everything that other organs, tissues, and cells determine to be waste products, such as toxins and carbon dioxide (CO₂). Instead of resisting and fighting, the heart accepts everything and transforms it.

While the heart offers blood to the body, it also nourishes itself in the process through the coronary arteries. The heart nourishes itself first—but only once blood leaves the heart to travel to other areas of the body, near and far. This principle of self-nourishment is reflected in the importance of giving love to ourselves in order to give love to others—to love ourselves as part of loving others. The heart is the conductor and communicator that makes our system whole. Unfortunately, this organ is dramatically affected by galectin-3.²⁶ When under the influence of galectin-3, the heart becomes rigid like a rock. It loses its flexibility and ability to pump blood, its ability to give.

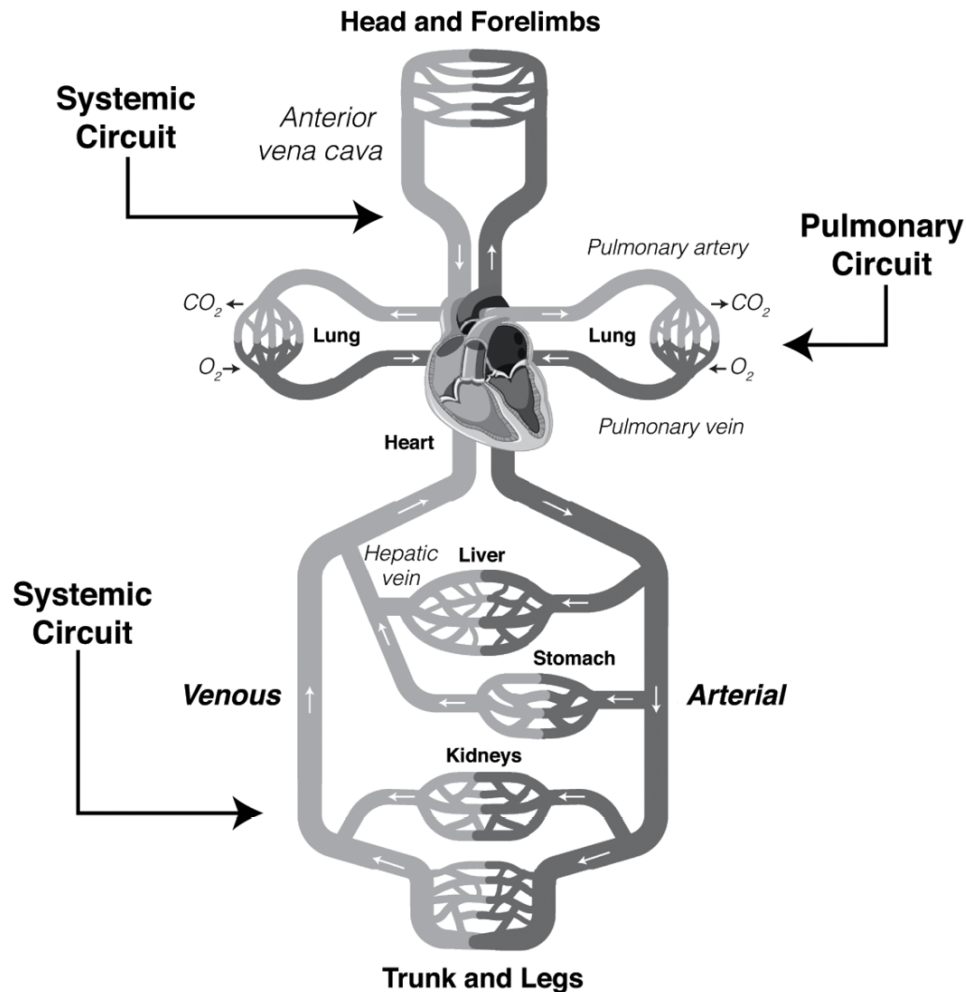
Physiology of the Heart

To more clearly understand the effects of the survival response on the heart, let's quickly investigate its physiology. The heart has two circulatory pathways that flow at the same time: the systemic circuit and the pulmonary circuit. In the *systemic circuit*, the blood leaves the heart, circulates throughout the body, and returns to the heart. The systemic circuit brings clean, oxygen-rich arterial blood and nourishment from the heart to the organs and tissues and returns dirty, deoxygenated venous blood back from the organs and tissues to the heart.

In the *pulmonary circuit*, deoxygenated blood travels from the heart to the lungs. The lungs then release CO₂ and other volatile toxins through exhalation and absorb oxygen through inhalation. In the process, “dirty” deoxygenated blood from the systemic circuit is transformed into “clean” oxygenated blood. The oxygen-rich blood then returns to the heart, ready

for the heart to share it with the whole body.

Human Circulatory System



Every beat of the heart is produced by a biochemical reaction between calcium and magnesium, with calcium causing contraction and magnesium causing relaxation. The strength and rate of heart contractions are affected by the autonomic nervous system, which determines how strong and fast the heart contracts. Over the course of an average lifetime, the heart will beat 2.5 billion times.²⁷

Since the heart's job is to offer blood all the time, it also has a backup, automated, self-regulatory system that is independent of the autonomic nervous system. Known as the intracardiac nervous system, this neural network is sometimes referred to as the “little brain” within the heart. Through this intracardiac nervous system, the heart produces its own neurotransmitters and sends more information to the brain than any other organ.²⁸ In fact, the intracardiac nervous system has been found to have both short-term and long-term memory functions.²⁹ This suggests that the way the heart “feels” can affect our entire body and experience. The heart-brain connection is an amazing intricate system with so much yet to be discovered. Remarkably, some individuals have even noticed a change in behavior or personality following a heart transplant.

Now that we understand how the heart works, let's take a look at how these functions can be disrupted by galectin-3.

Heart Conditions and Galectin-3

We often hear that heart disease is responsible for one in four deaths in the United States. But what *is* heart disease? This phrase refers to a number of conditions specifically affecting the heart, including coronary artery disease, myocardial infarction (heart attack), arrhythmia (abnormal heart rhythms), and heart failure, to name a few. *Cardiovascular disease*, by contrast, encompasses conditions of the heart and of the circulatory system and blood vessels.³⁰

Galectin-3 can adversely affect the entire range of cardiovascular and heart diseases, and it plays a very specific and especially troubling role when it comes to heart failure.³¹ Healthy cardiac tissue has a low baseline expression of galectin-3, but during a cardiac injury, galectin-3 increases rapidly, and the cardiac tissue shifts to a specific, fibrosis-driven repair

called *cardiac remodeling*: the tissue undergoes structural changes in response to the injury, and it's converted into nonfunctional scar tissue. It's rendered useless.

Testing for Cardiac Fibrosis

How can we be aware of the fibrotic process before it's too late? We can test for different markers that point to a state of chronic inflammation and fibrosis. The information below is a bit technical, yes. But most doctors won't run all of these tests, so I find it helpful to share this information with my patients so they can advocate for themselves.

Tests can be run for galectin-3, CRP (C-reactive protein, an indicator of systemic inflammation), ferritin (a blood protein containing iron that can indicate inflammation), fibrinogen activity (an indicator of inflammation and fibrosis), ESR (erythrocyte sedimentation rate, with a faster rate indicating inflammation), TGF- β (transforming growth factor beta; a multifunctional cytokine/signaling protein that can indicate fibrotic processes), and lipid peroxidation, (an inflammatory marker), among others.

We can also test cardiac-specific fibrotic markers, such as peptide BNP (B-type natriuretic peptide), and NT-proBNP (N-terminal-proBNP).

If you are concerned about your heart function or are experiencing shortness of breath upon exertion, you can ask your doctor if it's possible to run these tests, so they can rule out heart failure.

Once hospitalized because of heart failure, about half of patients die within five years.³² And the more elevated the levels of galectin-3, the worse the outcome.³³ To give you a sense of how galectin-3 can impact death rates in individuals with heart failure, we can look to a large study that examined the all-cause mortality of over five hundred heart-failure

patients over a period of one year. All-cause mortality is one of the most important end points of any study. It tallies all the deaths in a population being studied, whether they are attributed to heart attacks, stroke, cardiac rhythm disturbances, or other conditions. The researchers examined the levels of galectin-3 in the blood. If galectin-3 levels were under 17.8 nanograms per milliliter (ng/ml), 12.5 percent (one in eight) patients died within one year. And if galectin-3 levels were over 25.6 ng/ml, 37 percent (more than one third) of the patients died within a year. The one-year rate of death tripled! ³⁴

Types of Heart Failure

Left-Sided Heart Failure—This is the most common type of heart failure. The left ventricle, located in the bottom left side of your heart, is supposed to pump oxygen-rich blood to the rest of your body. In left-sided heart failure, blood backs up into your lungs instead of the body, causing shortness of breath and a build-up of fluid in your lungs.

Right-Sided Heart Failure—This type of heart failure occurs when the right ventricle can't perform its job and is typically triggered by left-sided heart failure. The accumulation of blood in the lungs caused by left-sided heart failure forces the right ventricle to work harder, which causes the right side to become stressed and fail. Right-sided heart failure can also result from other conditions, such as lung disease, and can lead to fluid backup and swelling in the legs, feet, and abdomen.

Diastolic Heart Failure—This type of heart failure occurs when the heart muscle becomes stiffer than normal due to heart disease. The heart muscle contracts normally, but the ventricles do not expand as they fill with blood, leading to a lack of blood flow to the rest of the organs in your body. Diastolic heart failure is more common in women than in men.

Systolic Heart Failure—This type of heart failure occurs when the heart is still able to expand but loses its ability to contract, like an overstretched rubber band that has lost its flexibility. It usually develops when the heart is weak and enlarged, and is more common in men than in women.

Diastolic and systolic heart failure can occur on the left or right side of the heart, or both. Galectin-3 plays a leading role in heart failure, especially in the diastolic type. This culprit protein directly induces pathologic remodeling of the heart and development of cardiac fibrosis. It has also been shown to be a useful biomarker in assessing the risk for earlier death from heart failure.

There's ample evidence on the causative and prognostic value of galectin-3 and the role it plays in heart disease. As such, multiple studies have shown that when we administer MCP, we can prevent, improve, and often reverse different cardiovascular diseases.³⁵ The inhibition of galectin-3 slows the progression of myocardial inflammation, supports cardiac recovery without causing fibrosis, and improves cardiac function.

THE KIDNEYS

Now let's move from the beginning of our circulatory system to the end of it. The kidneys are bean-shaped organs that are slightly larger than the size of a fist and located at the back part of the abdomen in the flank area. The kidneys serve as our filtration and buffering system. They remove waste and extra fluids from the body and maintain a healthy balance of water, salt, and minerals. Altogether, the kidneys filter about 150 quarts of blood on a daily basis, with only one to two quarts becoming urine.

The kidneys have a sophisticated system for regulating their blood supply. Common medical conditions such as hypertension, diabetes, and

arteriosclerosis reduce the blood supply to the kidneys, causing insufficient oxygen in their tissues and cells. When this happens, it triggers a survival response. In order to increase their blood supply, the kidneys secrete specific hormones that increase blood pressure throughout the body, causing further damage to themselves, the heart, and the rest of the body. This is another example of the survival paradox, where an organ's survival response ends up damaging itself and the body as a whole.

According to Chinese medicine, the kidneys provide reserve energy to any organ in the body that is depleted and low in energy. The strength of the kidneys can also determine our inherent capacity, which naturally relates to our genetics. The concept of genetics in Chinese medicine, our inherent potential, is described by the Chinese term *jing*, commonly translated as “essence.” The kidneys are the storehouse of our *jing*, and Chinese medicine uses different therapeutic methods, such as acupuncture, herbs, qigong, and Tai Chi to nourish and maintain the *jing*.

Chronic Kidney Disease







Chronic kidney disease (CKD) is perhaps the most overlooked medical condition, affecting about 14 percent of the population and 38 percent of the adult population over the age of sixty-five. It can be caused by impaired blood flow, autoimmune processes, infections, chemical insults, side effects from different medications, and other causes.³⁶

Diabetes is the leading cause of CKD and kidney failure, along with hypertension and arteriosclerotic disease. Most CKD develops gradually, and people can go many years without symptoms before it's discovered.³⁷

There are four stages of CKD. Each stage reflects the level of decrease in the volume of blood that the kidneys can filter in one minute, also known

as the *estimated glomerular filtration rate* (eGFR). CKD is diagnosed when abnormalities of kidney function are present for more than three months. Too often, it goes unnoticed until it is quite advanced.

According to conventional medicine, there is no cure for CKD, and there is no established treatment to stop the process from occurring. Current treatments attempt to slow the deterioration by controlling contributing factors like high blood pressure, high blood glucose levels, and autoimmune processes, and by eliminating pharmaceuticals and chemicals that damage our kidneys. However, I have witnessed remarkable reversals of CKD with the integration of innovative treatment strategies.

STAGES OF CHRONIC KIDNEY DISEASE		GFR*	% OF KIDNEY FUNCTION
STAGE 1	Kidney damage with normal kidney function	90 or higher	 100 - 90%
STAGE 2	Kidney damage with mild loss of kidney function	89 to 60	 89 - 60%
STAGE 3A	Mild to moderate loss of kidney function	59 to 45	 59 - 45%
STAGE 3B	Moderate to severe loss of kidney function	44 to 30	 44 - 30%
STAGE 4	Severe loss of kidney function	29 to 15	 29 - 15%
STAGE 5	Kidney failure	Less than 15	 < 15%

* Your GFR (glomerular filtration rate) number is an estimate of how much kidney function you have. As kidney disease gets worse, the GFR number goes down.

Diagnosing Chronic Kidney Disease

The classic indication of reduced kidney function is an elevation in *creatinine* (the waste product produced by muscles from the breakdown of the compound *creatine*). The kidneys remove creatinine from the body, and they filter almost all of it from the blood and release it into the urine. When kidney function decreases, creatinine is not cleared quickly enough, and its levels can rise in the blood.

Although creatinine blood level is part of the routine chemistry blood test, a mild increase in creatinine can often be overlooked by healthcare practitioners. This is because the kidney has reserve filtration capacity, so it can still function if there is a small amount of damage. This means the kidneys can continue to eliminate creatinine in the early stages of kidney damage. Therefore, by the time creatinine levels start to rise, there can already be significant damage to the kidneys.

A better diagnostic measure for early deterioration in kidney function is the eGFR, and eGFR is routinely added to basic chemistry blood tests. When kidney damage begins, the eGFR will decrease accordingly. This decrease can be observed long before changes in creatinine levels occur and can be a helpful barometer in diagnosing early stage kidney damage.

Galectin-3 in Kidney Disease

Every year, kidney disease kills more people than breast and prostate cancer combined. African American, Hispanic, American Indian, and Alaska Native individuals are more likely to develop kidney disease, and the prevalence is increasing globally due to the aging of our population.³⁸ If a person reaches a point where the kidneys lose their ability to filter the blood, they're considered to be in "end-stage renal disease." This is when

dialysis or a transplant is required. Regardless of the reason for CKD, the damaging cascade starts with inflammation and is followed by fibrosis.

When in utero, galectin-3 is important for promoting *nephrogenesis* inside the kidney cell, or normal development of the filtration system. After all, normal development is part of our survival mechanism. But after birth and throughout our life, galectin-3 plays a very different role—it drives inflammation and fibrosis, with much faster kidney deterioration. Therefore, higher levels of galectin-3 result in increased morbidity and mortality in CKD patients, including in patients with end-stage renal disease and those undergoing dialysis treatment.

Regardless of the cause of the CKD, the damaging mechanism and process always involves inflammation and fibrosis. And as you know by now, both are driven by galectin-3. The good news is, if we catch the issue while it's still in the inflammatory phase, *we can stop the inflammation and the fibrotic process*, and the kidney can regenerate.



CATHY'S STORY

Cathy was a very health-conscious patient. She took care of herself, but in a routine medical test, her doctor discovered that her eGFR was 65. This meant she had stage 2 CKD.

Over the next two to three years, Cathy's kidney function slowly deteriorated. Her eGFR dropped to about 55, classifying her with stage 3 CKD. At this point, she came to see me, and she underwent a single therapeutic apheresis treatment combined with a protocol of fifteen grams

of MCP daily. Three months later, her eGFR had increased to 86! Another three months later, we repeated the blood test, and it revealed a complete recovery of kidney function with a normal eGFR of 96.

I've seen this type of turnaround with patients in my medical practice who've had deterioration in kidney function due to CKD. When the inflammation is addressed, it's possible to reverse it completely, and patients can improve even in advanced stages of the disease. Imagine what this could mean for the millions of people with CKD!

THE INFLUENCE OF BLOOD PRESSURE IN BOTH ORGANS

If a person's blood pressure is too high, it hits the walls of the blood vessels and causes ongoing damage. The body naturally attempts to repair the damage caused by this injury through mounting an inflammatory response. This inflammation-driven response causes a thickening of the arteries, as well as a narrowing of the arteries, known as arteriosclerosis. In the heart, this eventually leads to coronary artery disease, which can result in a heart attack. At the tissue level, it will cause inflammation and fibrosis, tissue remodeling, and tissue dysfunction in both the heart and kidneys.

Nowadays, there are much stricter guidelines than in the past when it comes to optimal blood pressure control. Some encourage lowering the standard recommended blood pressure to under 120 over 80. From a holistic perspective, we view blood pressure a bit differently. We ask ourselves why different people function with different blood pressure levels. Our blood pressure is the pressure needed to sustain our system, allowing us to survive. The amount of pressure needed in the system for a person to carry their responsibilities in life will vary from individual to individual.

For example, certain people have little responsibility, either by nature or by choice, and they don't hold on to things or feel under pressure—it is easy for them to let go. Such individuals will thrive at a lower blood pressure. Others do a lot of things, have multiple responsibilities, and hold on tightly to their commitments. These individuals need more nourishment and support—they need more “pressure”—to keep their system going, and the additional required blood supply often manifests as higher blood pressure. Such individuals don't do well when their blood pressure decreases to levels below 120 over 80. They won't feel like they have enough energy in their system. However, this can be damaging over time. For these individuals, changing their lifestyle and habits is key to improving their blood pressure and health.

I'm not sharing this information only as an anecdote but as a way to give you a broader understanding of the significance of blood pressure. In Chinese medicine, those with expertise in pulse diagnoses can identify individuals with high blood pressure patterns, even if their blood pressure measurement appears to be normal. These individuals can develop the complications of high blood pressure over the years, including heart disease, even while their measurements remain within the acceptable range.

As an additional insight for healthcare practitioners, we should pay special attention to those who have had low blood pressure throughout their lives and one day show up with normal blood pressure. This indicates they are experiencing high blood pressure compared to their baseline.

CARING FOR THE HEART AND KIDNEYS

As stated earlier, we're discussing both the heart and kidneys in this chapter

because there is a unique connection between these two organs. Because the heart and kidneys work in consort to keep the body healthy, if there is a problem in one of these organs, there will often be an issue in the other. This also means that when you endeavor to protect one, you also help protect them both.

We've mentioned that patients with CKD often die from heart disease and that galectin-3 provides us with an important link to understanding the relationship between the heart and kidneys. Their connection was clearly demonstrated in a recent study published in one of the American Heart Association's peer-reviewed journals.³⁹ This landmark publication included both an animal study as well as extensive human clinical data.

In the animal study, the blood supply to the kidneys of mice was shut down for a brief time. The lack of blood supply resulted in acute kidney injury (AKI), which caused a spike of galectin-3 in the blood of the mice. The galectin-3 traveled to their hearts and caused cardiac remodeling and heart damage. However, when the same interruption of blood supply was performed on the legs and not the kidneys, there was no negative effect on the heart—*the interruption of blood supply had to occur in the kidneys in order to have an effect on the heart.*

Furthermore, when the same experiment was conducted on a specific kind of mice that could not produce galectin-3, there was no damage to the heart—without galectin-3, the increase in inflammatory compounds that cause damage to the heart was prevented. However, when the experiment was conducted on the original mice that demonstrated heart damage, the damage was prevented with the administration of MCP.

But the study doesn't end there. The researchers then took the mice that couldn't produce galectin-3 and gave them galectin-3-producing bone

marrow. When blood supply to their kidneys was interrupted, the damage signal from the kidneys traveled to the bone marrow and stimulated immune cells that excreted galectin-3, which then traveled to the heart and caused heart damage.

In the human study, the same researchers studied 1,110 patients in 23 different ICUs in various countries who were undergoing coronary bypass surgery. Prior to surgery, they checked galectin-3 levels in the patients' blood. The researchers found that the level of galectin-3 in the blood *before surgery* predicted a patient's likelihood of AKI after the surgery, as well as long-term kidney and cardiac damage. This study vividly demonstrated the underlying connection between these two organs and how this connection can be influenced by galectin-3.

With this physiological connection in mind, I want to use this section to present a multifaceted approach—including tests, exercise and diet regimens, and supplements and herbs—that can be used to support a medical program. No matter your current state of health or the detailed protocol you may be following for a specific disease, supporting the heart and kidneys is paramount for health and well-being. These key support systems can be adapted for various conditions.

Lipid Inspection

Both the heart and kidneys are affected by elevated oxidized lipids and cholesterol. In order to optimally address this risk factor, we need an accurate assessment of our lipid and cholesterol status. Doctors generally check lipids and cholesterol levels of patients, but they often don't analyze the *quality* of the lipids. A patient can have normal lipid and cholesterol levels, but the damaging subgroups of lipids can be sky high and vice versa.

For example, when a specific lipoprotein called *lipoprotein (a)* (abbreviated LP(a)), is elevated, the risk for heart disease, strokes, and liver cancer dramatically increases. The tendency for elevated LP(a) is usually genetic, and a patient can have extremely elevated LP(a) while retaining completely normal cholesterol levels. When this is the case, controlling lipids and regulating mitochondrial function becomes important. Intermittent fasting can help regulate the energy-generation mechanisms that cause abnormal mitochondrial function.

Circulation and Reduction of Stress

Supporting healthy circulation is a key element in treating the heart and kidneys, and regular exercise is critical for supporting healthy circulation. There are many forms of exercise and physical activity that are of benefit, and both aerobic and weight-bearing exercise are important, especially as we age.

I recommend walking as the best form of exercise, but we have to walk fast enough to raise our pulse and break into a good sweat to sufficiently stimulate our circulation. Intermittent jogging is also good, as it serves to develop our aerobic capacity. The intermittent change between walking and jogging allows us to increase our mitochondrial function while giving the body time to recover. This helps prevent the buildup of oxidative stress.

We want to exercise for the sake of our health and well-being. Exercise in itself makes a huge contribution to our health, and the merit and benefit of exercise is not found in competition or overexertion but in the simple fact that we are exercising. For twenty, thirty, or forty minutes, all you really have to do is put one foot in front of the other, take another turn on the pedals, or swim another lap. This helps establish healthy circulation, reduce stress, and build resilience.

Stress can also be reduced through yoga, Tai Chi, qigong, and other relaxing and meditative practices. Stress reduction is of the utmost importance because we don't want to produce inflammatory cytokines that can damage the heart and kidneys.

Our heart and kidney function can also be supported by other behavioral factors, such as fostering kindness, sharing with others, balancing our personal drive, and finding contentment in our everyday lives.⁴⁰ We will discuss these in greater detail in Chapter 16.

Diet for the Kidneys

We also need to avoid certain foods and medications, especially when it comes to the kidneys. If our kidneys are not functioning well, some medicines that should be cleared by the kidneys can accumulate in the body and cause damage in different organs, including the kidneys themselves.

For food, we need to consume protein that is easily digested, either in the form of vegetarian protein or high-quality fish. I often recommend that my patients avoid red meat because it's hard to digest and contains oxidized lipids and heat-damaged proteins, which can harm the body. In both heart and kidney disease, it's also important to regulate surges of insulin. In principle, we should follow a low-glycemic, anti-inflammatory diet and possibly incorporate intermittent fasting.

MCP Treatment

For heart and kidney health, the use of MCP is crucial—it can both protect the heart and kidneys and improve their function. I recommend taking fifteen grams per day, divided into two to three doses.

If you have advanced CKD with an eGFR under 30, you can start with

an initial dose of 10 grams per day, or 5 grams per day if your eGFR is under 15, while monitoring your potassium. This monitoring is important because patients with severe kidney damage have a limited ability to excrete potassium. The MCP that I recommend is buffered with potassium and sodium in a 4:1 ratio, similar to the ratio in vegetables and fruits, and you want to make sure that the potassium doesn't accumulate in your body. Patients without advanced CKD can take the recommended 15 grams per day, divided into two to three doses.

Supplements and Botanicals for Kidney and Cardiovascular Health

Different botanicals and supplements can help the heart and kidneys, lower and regulate damaging metabolites, and optimize health. One remarkable preparation is a Tibetan-based herbal formula that has been featured in dozens of published papers, including multiple clinical trials for cardiovascular and circulatory support, called Padma Basic. Other botanicals that support circulation are hawthorn, *Salvia miltiorrhiza* (dan shen), and turmeric (curcumin). Nattokinase and lumbrokinase (enzymes produced through fermentation) are also of great importance, as are tocotrienols (compounds in the vitamin E family). Medicinal mushrooms, especially *Cordyceps sinensis* and *Ganoderma lucidum* (reishi) are of great importance as well, as is, of course, MCP.

Other key areas to address in this program include:

1. **Inflammation Reduction**—This can be achieved by using honokiol, quercetin, curcumin, Boswellia, and bromelain.
2. **Antioxidant Support**—This includes well-balanced mineral supplementation with sufficient zinc. Beware of iron overload, as this can

be damaging to the circulation.

3. Energy Support—Adaptogenic herbs (herbs that help the body function better when under stress and exertion) support healthy circulation and energy production, and therefore will also provide cardiovascular support. Examples are astragalus, ginseng, eleutherococcus, ashwagandha, and others.

4. Mitochondrial support—There are different nutrients and cofactors that provide energy support at the intracellular level. These include thiamine (B₁), alpha-lipoic acid, B₂, B₆, carnitine and acetyl-L-carnitine, Coenzyme Q10, NAD+, and others.

More detailed information and guidelines are included in the “Cardiovascular and Kidney Disease” section of Appendix D.



ROBERT'S STORY

Robert was a fifty-five-year-old accountant who was referred by a colleague for therapeutic apheresis. Robert started having hypertension as a teenager for unexplained genetic reasons. Over the years, he developed significant peripheral vascular disease and heart failure. Then, four to five years ago, after an incidence of kidney stones, he was diagnosed with moderate stage-3 CKD. Robert underwent multiple integrative and complementary treatments, including different stem cell therapies, but unfortunately, he was not improving.

When he arrived at the clinic, he could barely walk the ten yards from

his car to the front door—he had to lean on a family member for support and was breathing heavily by the time he entered the building. I welcomed Robert as he walked in, quickly sat him down in the reclining chair in my office, and brought the oxygen-generator to him. His health was obviously much worse than what I had been told. His ashen gray color, profuse perspiration, and shortness of breath were indicative of his severe heart failure and were quite worrisome.

Robert was deteriorating rapidly. According to his latest blood work, his eGFR was close to 15 ml/minute—he was on the verge of requiring dialysis, and his heart failure was severe. Knowing that he was out of options, I had to decide whether it was safe for him to undergo apheresis, specifically LDL apheresis—a specific kind of therapeutic apheresis designed for patients with heart disease, genetically elevated cholesterol, and elevated LP(a)—which he wouldn't be able to get anywhere else. Given his condition, it would require considerable modifications to the normal protocol. If I treated him, I needed to do it with great care. On the other hand, if I didn't treat him, his death would be imminent.

I had faced decisions like this many times before—I had to draw on all available medical information and combine it with whatever insight and intuition I had. When I looked at Robert's case, some of his inflammatory markers were significantly elevated. While his lipid profile wasn't highly elevated, his LP(a) was more than two times higher than the normal range. Unfortunately, his elevated LP(a) (the single most important factor for both his heart and arteriosclerosis-driven kidney disease) had been overlooked for more than thirty years. Both LP(a) and the elevated inflammatory markers could be dramatically reduced by apheresis. I got my answer!

Robert underwent two apheresis treatments, two days apart. When the

first treatment was concluded, I knew that Robert was going to get his life back. By the end of the second treatment, he looked like a different person. He was no longer in distress, he could walk on his own, and his color was better.

After not being able to work for a year, Robert returned to work within two to three weeks after the apheresis. He had his energy back, was sleeping better, his blood pressure had stabilized, and his kidney function improved significantly. He had come back to life!

OUR ACCESS TO LIFE

The heart and kidneys are the first organs and organ systems I have discussed in Part 2 of the book because they are our basic access to life. Within our physiology, the heart represents the nourishment of the body through the blood that reaches every cell in the body. The kidney takes that same blood, filters it out, and through the urine, excretes it out of the body. As such, they represent both ends of our circulation, which nourishes every cell in the body. This is why kidney and heart disease are such big contributors to morbidity and mortality. And of course, this is also why understanding and taking care of our kidney and heart health is so fundamental to our well-being and longevity. The heart and kidneys are our beginning and end. When we care for them properly, we extend and enhance what exists between our beginning and our end: our life itself.

²⁵ Salvatore Sciacchitano, Luca Lavra, Alessandra Morgante, Alessandra Ulivieri, Fiorenza Magi, Gian De Francesco, Carlo Bellotti, Leila Salehi, and Alberto Ricci. “Galectin-3: One Molecule for an Alphabet of Diseases, from A to Z,” *International Journal of Molecular Sciences* 19, no. 2 (2018): 379. <https://doi.org/10.3390/ijms19020379>.

²⁶ Carolin Gehlken, Navin Suthahar, Wouter C. Meijers, and Rudolf A. De Boer, “Galectin-3 in Heart Failure,” *Heart Failure Clinics* 14, no. 1 (2018): 75–92, <https://doi.org/10.1016/j.hfc.2017.08.009>.

²⁷ Fred Shaffer, Rollin Mccraty, and Christopher L. Zerr, “A Healthy Heart Is Not a Metronome: An Integrative Review of the Heart’s Anatomy and Heart Rate Variability,” *Frontiers in Psychology* 5

(2014), <https://doi.org/10.3389/fpsyg.2014.01040>.

²⁸ Isabel Durães Campos, Vitor Pinto, Nuno Sousa, and Vitor H. Pereira, “A Brain within the Heart: A Review on the Intracardiac Nervous System,” *Journal of Molecular and Cellular Cardiology* 119 (2018): 1–9, <https://doi.org/10.1016/j.yjmcc.2018.04.005>.

²⁹ Mitchell B. Liester, “Personality Changes Following Heart Transplantation: The Role of Cellular Memory,” *Medical Hypotheses* 135 (2020): 109468, <https://doi.org/10.1016/j.mehy.2019.109468>.

³⁰ “Heart Disease,” Centers for Disease Control and Prevention. Centers for Disease Control and Prevention, October 22, 2020, <https://www.cdc.gov/heartdisease/index.htm>.

³¹ Navin Suthahar, Wouter C. Meijers, Herman H. W. Silljé, Jennifer E. Ho, Fu-Tong Liu, and Rudolf A. De Boer, “Galectin-3 Activation and Inhibition in Heart Failure and Cardiovascular Disease: An Update,” *Theranostics* 8, no. 3 (2018): 593–609. <https://doi.org/10.7150/thno.22196>.

³² Danielle M. Henkel, Margaret M. Redfield, Susan A. Weston, Yariv Gerber, and Roger Véronique, “Death in Heart Failure,” *Circulation: Heart Failure* 1, no. 2 (2008): 91–97, <https://doi.org/10.1161/circheartfailure.107.743146>.

³³ R. A. De Boer, D. J. Van Veldhuisen, R. T. Gansevoort, A. C. Muller Kobold, W. H. Van Gilst, H. L. Hillege, S. J. L. Bakker, and P. Van Der Harst, “The Fibrosis Marker Galectin-3 and Outcome in the General Population,” *Journal of Internal Medicine* 272, no. 1 (2011): 55–64, <https://doi.org/10.1111/j.1365-2796.2011.02476.x>.

³⁴ Francisco Javier Carrasco-Sánchez, Oscar Aramburu-Bodas, Prado Salamanca-Bautista, José Luis Morales-Rull, Luis Galisteo-Almeda, María Inmaculada Páez-Rubio, José Luis Arias-Jiménez, Mariano Aguayo-Canela, and Juan Ignacio Pérez-Calvo, “Predictive Value of Serum Galectin-3 Levels in Patients with Acute Heart Failure with Preserved Ejection Fraction,” *International Journal of Cardiology* 169, no. 3 (2013): 177–82, <https://doi.org/10.1016/j.ijcard.2013.08.081>.

³⁵ Jaime Ibarrola, Ernesto Martínez-Martínez, J. Sádaba, Vanessa Arrieta, Amaia García-Peña, Virginia Álvarez, Amaya Fernández-Celis, et al., “Beneficial Effects of Galectin-3 Blockade in Vascular and Aortic Valve Alterations in an Experimental Pressure Overload Model,” *International Journal of Molecular Sciences* 18, no. 8 (2017): 1664, <https://doi.org/10.3390/ijms18081664>.

Yonggang Lu, Mingming Zhang, Pei Zhao, Min Jia, Bing Liu, Qian Jia, Jun Guo, Lin Dou, and Jian Li, “Modified Citrus Pectin Inhibits Galectin-3 Function to Reduce Atherosclerotic Lesions in ApoE-Deficient Mice,” *Molecular Medicine Reports* 16, no. 1 (2017): 647–53, <https://doi.org/10.3892/mmr.2017.6646>.

Ernesto Martínez-Martínez, Laurent Calvier, Amaya Fernández-Celis, Elodie Rousseau, Raquel Jurado-López, Luciana V. Rossoni, Frederic Jaisser, et al., “Galectin-3 Blockade Inhibits Cardiac Inflammation and Fibrosis in Experimental Hyperaldosteronism and Hypertension,” *Hypertension* 66, no. 4 (2015): 767–75, <https://doi.org/10.1161/hypertensionaha.115.05876>.

Mathilde Prud’Homme, Maxime Coutrot, Thibault Michel, Louis Boutin, Magali Genest, Françoise Poirier, Jean-Marie Launay, et al., “Acute Kidney Injury Induces Remote Cardiac Damage and Dysfunction through the Galectin-3 Pathway,” *JACC: Basic to Translational Science* 4, no. 6 (2019): 717–32. <https://doi.org/10.1016/j.jacbts.2019.06.005>.

Kenneth Wong, “Modified Citrus Pectin as Therapy in Heart Failure,” ISRCTN Registry, 2012, <https://doi.org/10.1186/isrctn49496801>.

Geng-Rui Xu, Chuang Zhang, Hong-Xia Yang, Jia-Huan Sun, Yue Zhang, Ting-Ting Yao, Yuan Li, Lin Ruan, Ran An, and Ai-Ying Li, “Modified Citrus Pectin Ameliorates Myocardial Fibrosis and

Inflammation via Suppressing Galectin-3 and TLR4/MyD88/NF-KB Signaling Pathway,” *Biomedicine & Pharmacotherapy* 126 (2020): 110071, <https://doi.org/10.1016/j.biopha.2020.110071>.

³⁶ “Chronic Kidney Disease in the United States, 2019,” Centers for Disease Control and Prevention, March 11, 2019, <https://www.cdc.gov/kidneydisease/publications-resources/2019-national-facts.html>.

³⁷ “Diabetic Kidney Disease,” National Institute of Diabetes and Digestive and Kidney Diseases, US Department of Health and Human Services, February 1, 2017, <https://www.niddk.nih.gov/health-information/diabetes/overview/preventing-problems/diabetic-kidney-disease>.

³⁸ “Race, Ethnicity, and Kidney Disease,” National Kidney Foundation, August 31, 2020, <https://www.kidney.org/atoz/content/minorities-KD>.

³⁹ Prud’Homme et al., “Acute Kidney Injury.”

⁴⁰ Karen E. Steihauser, Stewart Alexander, Maren K. Olsen, Karen M. Stechuchak, Jennifer Zervakis, Natalie Ammarell, Ira Byock, and James A. Tulsky, “Addressing Patient Emotional and Existential Needs During Serious Illness: Results of the Outlook Randomized Controlled Trial,” *Journal of Pain and Symptom Management* 54, no. 6 (2017): 898–908, <https://doi.org/10.1016/j.jpainsymman.2017.06.003>.

CHAPTER NINE

LIVER AND LUNG DISEASES

Ancient Chinese medicine offers us an opportunity to develop a deeper insight into the function of organs by, for example, exploring how we function in space and time; how different organs are affected by the past, present, and future; and how the pace of movement and change in our lives affects our health and well-being. From this perspective, you can understand how fixed, predetermined treatment protocols are limiting by nature.

Space and time are interdependent phenomena. When we speak of “distance,” we are really referring to the measurement of space from one point to another. Distance is calculated by the speed traveled from the starting point to the end point, multiplied by the amount of time it took to go between these two points ($\text{Distance} = \text{Speed} \times \text{Time}$). Our experience of space or distance relates to how fast things are moving within a particular time frame.

Speeding up within a confined space inevitably produces heat. This is one of the most basic principles in physics. Now think about what happens in the body, a confined space. Sympathetic responses such as rising heart rates, increased blood pressure, and faster breathing are all examples of high-speed movement. They all express themselves as heat—this results in inflammation.

This high-speed movement, which inevitably produces heat, impacts us mentally, emotionally, and physically. It can impair healthy flow. Think about the oil in a car: if the car heats up, you get sticky oils that dry out and inhibit motion. When things don't move, we get stuck. Becoming stuck creates

stagnation, and stagnation creates fibrosis.

This chapter presents the liver and the lungs. Both of these organs are involved in detoxification and the process of letting go, which reduces stagnation. As such, they also have an interesting relationship to space and time.

THE LIVER

To approach caring for the liver from a holistic perspective, let's look at how the organ functions, its tendency to get stuck and fibrotic, and how it's affected by galectin-3. As our “past and future” organ, the liver is responsible for countless enzymatic and chemical processes. It helps us process toxins from the past by promoting and regulating the detoxification process, and helps prepare us for functioning in the future by producing different lipids, hormones, and enzymes. When the liver produces new proteins and enzymes, it affects our future physiology. At the same time, the liver helps to clear our past by breaking down and getting rid of by-products from past reactions. As such, the liver is also our big detoxifier.

Think about it. The liver deals with the body's past and future, simultaneously taking care of both in the present. So, if the liver is not functioning smoothly, if it gets “stuck,” then we will have a problem dealing with the past and having clarity about the future—both physically and psychologically. We will become toxic. This naturally leads to frustration and anger, which, according to multiple ancient medical systems, are the dominant emotions associated with the liver. We all have experienced moments of anger and frustration, and often when these emotions dissipate, we experience a better sense of clarity. This is why the liver is considered to be the great strategist and planner in Chinese medicine.

The multidimensional and multifaceted function of the liver also makes it a

great and vital communicator. It is responsible for endless reactions and physiological activities, connecting them in a masterful way, and functioning as a central hub. Imagine what would happen in a major intersection if the lights suddenly turned off and everything got stuck? This is what happens in the body when the liver gets stuck, meaning that the liver is unable to detoxify properly or produce essential enzymes and hormones necessary for optimal function. Generally, the liver helps to keep everything moving. As such, it is supported by movement of all kinds: physical movement, emotional movement, and creative expression. Suppressing our emotions will adversely affect the liver.

It's no surprise that the isolating lattice formation properties of galectin-3 can be highly detrimental to the liver. If the liver becomes isolated and can no longer function effectively as a central hub, this will have grave consequences. In many ways, it's a physiological reflection of the change in modern times wherein we no longer live in an expanded family and community environment. When each person lives alone and communication happens increasingly over digital platforms, we share less with others. A healthy liver shares more communication, not less.

Unfortunately, the liver is also gravely affected by galectin-3. Multiple studies have found the master protein to be involved in the progression of liver fibrosis. This makes galectin-3 a sensitive liver biomarker—when levels increase it can indicate a worsening of the liver condition. Galectin-3 also contributes to immune dysregulation, progression of inflammation, and an imbalance of the microbiome (the community of microbes living symbiotically inside the human gut). Any of these can lead to cirrhosis (fibrosis of the liver), with a high risk of liver failure and cancer.⁴¹

The Unknown Liver Diseases

We're all well aware that excessive, long-term consumption of alcohol can

cause liver damage, inflammation, and fibrosis. However, we are not as aware of *nonalcoholic fibrosis with fatty liver disease* (NAFLD), which can develop into *nonalcoholic steatohepatitis disease* (NASH).⁴² These conditions are quite prevalent, affecting about 25 percent of the population, but they don't get the same attention as well-known conditions like hepatitis C, for instance, even though the outcomes of NAFLD and NASH are devastating.

To give you an idea of how serious an epidemic these conditions are, NAFLD affects about one billion people worldwide and between 80 to 100 million individuals in the United States. Twenty-five percent of them progress to NASH, and many people die from NASH. Blocking galectin-3, the driver of these conditions, is one of the best therapeutic options for treating them.⁴³

NAFLD is driven by genetic, epigenetic, and environmental factors. It's also caused by insulin resistance, obesity, insulin accumulation in the liver, increased intestinal permeability, and systemic inflammation of the gut. The liver is then predisposed to secondary causes of NAFLD because of oxidative stress, infection, mitochondrial dysfunction, proinflammatory cytokines, etc. These secondary factors are environmental in nature and relate to our lifestyle choices. They lead to inflammation, necrosis, and damage to the liver in NAFLD.

So, can liver damage and fibrosis be reversed? The answer is yes! Now that we understand the mechanism of damage, we can stop and reverse it. While many fatty liver diseases (alcoholic and nonalcoholic) do not respond to conventional anti-inflammatory therapies, these conditions will improve if we block galectin-3. In fact, studies have demonstrated that MCP can actually stop the progression of liver fibrosis.⁴⁴

THE LUNGS

Now that we have explored the liver, let's take a moment to look at the lungs

from a holistic perspective. Through our breath, the lungs establish our ongoing connection with the outside world and our environment, and in a greater sense, with the universe. The natural tendency of the lungs is to contract, exhale, and let go. The health of our lungs determines how well connected we are to the outside world, and this connection has a direct influence on our health.

Chinese medicine recognizes the connection between our organs and our emotions. While the liver expresses anger, resentment, and frustration, the lungs express grief and sadness. When the lungs function well and are able to let go, we can more easily release sadness and grief. When the lungs are unable to do their job, we can get consumed by sadness and grief, and shift our mental state to living in the past. This often causes deep and long-term exhaustion that can manifest as chronic fatigue and fibromyalgia.

Treating Pulmonary Issues

Infections of different kinds, chemical insults from cigarette smoke, pollution, asbestos, certain pharmaceutical agents, and other factors can affect the health of the lungs. However, one of the deadliest conditions of the lungs is *idiopathic pulmonary fibrosis* (IPF), with *idiopathic* meaning “of unknown cause.” Currently, there are no good treatments for IPF, but there is a growing focus in the pharmaceutical industry on targeting galectin-3 as the fibrosis-driving protein in this condition.

There are several interventions that can help with the health of our lungs, and the protocols will vary slightly based on the specific disease. We want to eat an anti-inflammatory, low glycemic, Mediterranean-style diet that is low in fructose and glucose, and high in fiber. We can also shut down metabolically induced damage by practicing intermittent fasting.

Caring for the colon and the microbiome is an important component of

lung health, as the colon is closely related to the lungs in Chinese medicine. We need to support and facilitate circulation through exercise and deep breathing, and support the microbiome through the use of prebiotics (nondigestible fiber that ferments and feeds gut bacteria) and probiotics (live beneficial bacteria). (On this topic, MCP is also an established prebiotic, with a number of scientific papers having been published on its benefits in that role.⁴⁵) And it doesn't make me a genius to tell you that, naturally, smokers need to quit smoking.

There are different botanicals that can help with pulmonary health. Many are quite similar to the ones used for heart health. Also important are adaptogenic herbs, such as ginseng, as well as herbs that move and clear phlegm, such as pinellia and licorice. Specific mushrooms for lung health are *Cordyceps sinensis*, *Ganoderma lucidum*, and *Tremella fuciformis*.

Honokiol, purified from Magnolia bark, is especially important for the lungs. It has a specific affinity to the lungs, meaning that when it is absorbed by the body, the highest concentration will be found in the lungs.

CYTOKINE STORMS, COVID-19, AND GALECTIN-3

With COVID-19, we've heard a lot about the hyperinflammatory immune response called a *cytokine storm*. A cytokine storm is the complicating factor in severe COVID-19 cases—forcing people into the ICU and onto ventilators. Specifically, it's the cytokine storm, not the virus itself, that can be so dangerous and deadly.

The cytokine storm begins when infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus responsible for COVID-19, triggers the body to produce more galectin-3. In turn, galectin-3 stimulates an inflammatory immune response in the form of a cytokine cascade. The release of massive amounts of inflammatory cytokines overwhelms the cardiorespiratory system. Interleukin 6 (IL-6), tumor necrosis factor alpha (TNF-alpha), and other inflammatory cytokines surge into affected areas like the lungs. In many people, they then start attacking healthy tissue and organs, creating a cytokine storm—a hyperactive immune system response that

can lead to organ damage, fibrosis, and in many cases, death.

Because galectin-3 is at the headwaters of the cytokine cascade, it's emerging as an important therapeutic target in the treatment of COVID-19. Researchers suggest that addressing galectin-3 can help regulate and rein in the deadly cytokine storm.

There's another important reason galectin-3 blockade is emerging as a possible strategy against COVID-19: the potential to prevent viral infection in healthy cells. The SARS-CoV-2 virus enters and infects healthy cells by using a unique spike protein that attaches to healthy cell receptors. Researchers discovered that the shape of the SARS-CoV-2 spike protein is nearly identical to the galectin-3 binding terminal—making the case that galectin-3 blockers could also block the virus from entering and infecting healthy cells.



ELIZABETH'S STORY

Many years ago, I treated Elizabeth, a renowned psychotherapist who was nearly sixty years old. She had chronic fatigue and fibromyalgia. She was dealing with unresolved issues she had with her father, who had already passed away. It was draining her energy and resulted in deep fatigue, widespread pains, insomnia, and weakened lungs.

I treated Elizabeth's tendency to be occupied with the past through the use of acupuncture. Acupuncture has specific points that relate to the perception of time and can therefore treat patterns and tendencies to hold to the past, present, and future—it addresses mental fixations that affect our health and well-being. For example, there are specific acupuncture points that can treat grief and strengthen the lungs, underscoring the interdependence between our mental, emotional, and physical state.

When Elizabeth returned for her next visit, she told me that the issues she

couldn't clear through years of therapy had been resolved, and she was now ready to move on to the issues she had with her mother. As you can imagine, I was happy about her successful shift, and with a big smile on my face, I advised her to skip this stage and just let go. And once she did, she finally was able to live in the present and experienced more energy and vitality. She was able to breathe easily once more.

THE INTERDEPENDENCE OF THE HEART, KIDNEYS, LIVER, AND LUNGS

I would like to conclude the current and previous chapters by revisiting the holistic and multidimensional relationships between the four organs that we discussed: the heart, kidneys, liver, and lungs. Each of these four organs have their own survival responsibilities, and the relationship and interactions between them can influence us on the physical, emotional, and psychological levels.

We discussed how the heart is the beginning of the circulatory system, the place where nourishment from the outside is distributed throughout the body, while the kidneys are the last stop of the arterial blood flow, before the venous blood makes its way back to the heart. These two organs have other vital relationships that make them a key axis. The kidneys hold our genetic potential, or what we can think of as our “inherent capacity.”

The heart has the potential to use the capacity provided by the kidneys for both physiological and personal transformation. While the physiological process of transforming dirty venous blood into clean arterial blood is automatic, the manifestation of personal growth and transformation requires intentional effort. Our heart allows us to find meaning in our lives. When the heart and kidneys are working in consort, our inherent capacity allows for the opening of the heart, resulting in spiritual maturation as we age. This helps us

develop an all-inclusive motivation to love and help all living beings, including ourselves.

According to Chinese medicine, when a person has strong kidneys but a weak heart, the kidneys' capacity and potential will lack the loving, all-inclusive quality of the heart. This lack is expressed as extreme personal drive and ego-driven ambition, together with a need to always win at any cost. To add another layer of holistic understanding, a skilled doctor of Chinese medicine will treat such a disharmony when they address the well-being of a patient.

The lungs, placed at the top of our torso, are the closest organ system to the outside world—they are the first to exhale air and the first to receive air through inhalation. As such, they are our gateway and initial connection to the outside world. The lungs are our first survival tool: although we may not be able to stop our heartbeat, we are able to hold our breath—we can breathe or not breathe. Breathing has power. It is an *active* power. Our lungs are therefore related to our activity and, more specifically, our immediate activity.

The kidneys are at the deepest level of our circulation, where the oxygen reaches last. Therefore, they hold our *capacity*. The relationship between the kidneys and the lungs is one of capacity and activity. When the relationship is balanced, one turns capacity into action, and action in turn feeds one's capacity in a continuous cycle of reciprocity.

However, when the kidneys are stronger than the lungs, one can have a certain capacity but not really do anything with it. We all know people whose activities don't express their full potential—they don't exhale their full potential. It is of greater concern when the situation is reversed, when one has strong lungs and weak kidneys. This can lead an individual to engage in activities beyond their potential and capacity, and attempt to achieve things of which they are not capable. It is of special concern when such people are

leaders or politicians.

Much of this connection is predetermined by genetics, but we can work to increase our capacity via deep breathing exercises, lifestyle changes, supplements and herbs, and by generally working to slow down and take in our world—to literally digest it.

Now, I want to discuss more of the key role of the liver as the big junction, the central hub. The liver detoxification process clears things from the past and helps us release them through the lungs. As I was writing this paragraph, a dear patient reached out to share her healing experience with me. While receiving an apheresis treatment with a specific focus on detoxifying the liver, she found herself crying all of a sudden. Her father had passed away the previous year, and despite their close relationship, she never cried and was unable to process his passing. “I could feel my father being cleared out of my blood,” she told me. For the first time, she was able to genuinely process his passing and let go.

The liver also produces building blocks that help the kidneys manifest their potential, and if the liver is not functioning well, we won’t be able to express our full potential. The liver constantly serves the function of the organs that relate to the past and the future. If it is well harmonized with the heart, it will help the heart guide our life in a transformative direction. And if instead, it is more connected to the lungs and skips its role in nourishing the heart, there can be a tendency toward short-term survival mode that lacks transformative qualities.

This multifaceted relationship between the organs has a profound effect on our health and well-being. The key organ that can harmonize it all is the heart. It is why the heart has an infinite healing potential. But in order to heal, the heart needs the support of the three other organs. Together, they shift us from surviving to thriving.

⁴¹ Jasmohan S. Bajaj, Douglas M. Heuman, Phillip B. Hylemon, Arun J. Sanyal, Melanie B. White, Pamela Monteith, Nicole A. Noble, et al., “Altered Profile of Human Gut Microbiome Is Associated with Cirrhosis and Its Complications,” *Journal of Hepatology* 60, no. 5 (2014): 940–47. <https://doi.org/10.1016/j.jhep.2013.12.019>.

Mohd Talha Noor and Piyush Manoria, “Immune Dysfunction in Cirrhosis,” *Journal of Clinical and Translational Hepatology* 5, no. 1 (2017): 1–9, <https://doi.org/10.14218/jcth.2016.00056>.

⁴² Hannah Drescher, Sabine Weiskirchen, and Ralf Weiskirchen, “Current Status in Testing for Non-alcoholic Fatty Liver Disease (NAFLD) and Nonalcoholic Steatohepatitis (NASH),” *Cells* 8, no. 8 (2019): 845. <https://doi.org/10.3390/cells8080845>.

Brandon J. Perumpail, Muhammad Ali Khan, Eric R. Yoo, George Cholankeril, Donghee Kim, and Aijaz Ahmed, “Clinical Epidemiology and Disease Burden of Nonalcoholic Fatty Liver Disease,” *World Journal of Gastroenterology* 23, no. 47 (2017): 8263–76, <https://doi.org/10.3748/wjg.v23.i47.8263>.

⁴³ Peter G. Traber, Hsin Chou, Eliezer Zomer, Feng Hong, Anatole Klyosov, Maria-Isabel Fiel, and Scott L. Friedman, “Regression of Fibrosis and Reversal of Cirrhosis in Rats by Galectin Inhibitors in Thioacetamide-Induced Liver Disease,” *PLoS ONE* 8, no. 10 (September 2013), <https://doi.org/10.1371/journal.pone.0075361>.

⁴⁴ Nashwa M. Abu-Elsaad, and Wagdi Fawzi Elkashef, “Modified Citrus Pectin Stops Progression of Liver Fibrosis by Inhibiting Galectin-3 and Inducing Apoptosis of Stellate Cells,” *Canadian Journal of Physiology and Pharmacology* 94, no. 5 (2016): 554–62, <https://doi.org/10.1139/cjpp-2015-0284>.

⁴⁵ Rong Di, Malathi S. Vakkalanka, Chatchaya Onumpai, Hoa K. Chau, Andre White, Robert A. Rastall, Kit Yam, and Arland T. Hotchkiss, “Pectic Oligosaccharide Structure-Function Relationships: Prebiotics, Inhibitors of Escherichia Coli O157:H7 Adhesion and Reduction of Shiga Toxin Cytotoxicity in HT29 Cells,” *Food Chemistry* 227 (2017): 245–54, <https://doi.org/10.1016/j.foodchem.2017.01.100>.

Chatchaya Onumpai Vakkalanka, Hoa K. Chau, Andre White, Robert A. Rastall, Kit Yam, and Arland T. Hotchkiss, “Pectic Oligosaccharide Structure-Function Relationships: Prebiotics, Inhibitors of Escherichia Coli O157:H7 Adhesion and Reduction of Shiga Toxin Cytotoxicity in HT29 Cells,” *Food Chemistry* 227 (2017): 245–54, <https://doi.org/10.1016/j.foodchem.2017.01.100>.

CHAPTER TEN

METABOLIC ISSUES

There is a genetic and epigenetic predisposition for just about every disease, and diabetes is no exception. Overall, however, *diabetes is spurred on by lifestyle choices*. It is one of the leading lifestyle-driven illnesses plaguing the Western world today.⁴⁶ About 34.2 million people of all ages—or 10.5 percent of the general US population—have been diagnosed with diabetes.⁴⁷ Roughly 27 percent of people age sixty-five years or older have this disease. More than 100 million US adults are now living with diabetes, prediabetes, or insulin resistance. When left unchecked, insulin resistance can develop into full-blown diabetes.

And today, insulin resistance doesn't only affect adults—we're seeing it much more often now in younger people, including teenagers. This boom in diabetes is not confined to the US. With globalization, dietary preferences have changed worldwide. The Chinese, who were once very trim and healthy, now have a higher incidence of diabetes because they've adopted a Western diet. And although it used to be unheard of for Yemenite Jews to have diabetes, after embracing a more modern lifestyle in Israel over the last seven decades, they too have become afflicted.⁴⁸

Diabetes is a medical issue of epidemic proportions affecting us globally, and especially in developing countries—and we're doing it to ourselves. How did we get to such a place in modern times?

FAILURE TO NOURISH

According to Chinese medicine, the pancreas is in charge of our nourishment and belongs to the earth element, which provides for us through food and water. From food comes glucose, the essential basic nourishing molecule, which the pancreas regulates.

The pancreas is centered in the middle of the abdomen, wrapped around the beginning of the small intestines where absorption takes place. In utero, we are nourished through the umbilical cord, taking in nutrients via blood from the mother. And once we are born, the nourishment shifts to the digestive system—to the earth element.

The pancreas assures our nourishment in two distinct ways: from the digestive system into the bloodstream, and from the bloodstream into the cells. It *excretes* digestive enzymes, helping us absorb food from the small intestine into our circulatory system, and it *secretes* insulin, allowing glucose to be absorbed from the bloodstream into our cells.

The body can have plenty of glucose circulating in the bloodstream, but if the glucose can't get absorbed into the cells, the cells will be starving even in the presence of high levels of glucose. Diabetes is a disease of starvation—we lose our ability to nourish ourselves on the cellular level, resulting in a survival-driven response that deteriorates our health and damages multiple organ systems.

Ordinarily, we are nourished by food, water, and air. We are provided for by the earth and our environment. Unfortunately, we have weakened our nourishment system. Our ability to sustain mother earth has been consistently diminished. We pollute the earth, exploit its minerals and contents, and we disrupt the harmony between the earth and its habitats. As a result, our nourishment system has lost its ability to feed us on a physical, emotional, and psychospiritual level.

The earth is no longer valued as a place of sustenance and community, of sharing and mutual support. The natural result is divisiveness on a physical level, by mounting walls between countries and communities; and separation at the level of the heart, by failing to see that all of us are in the same boat and on the same journey.

In Chinese medicine, the pancreas creates a sense of sticking together. With a weakening sense of community, we turn to food as a compensatory mechanism. If we look at sugar, when it gets wet, it becomes sticky, the individual sugar molecules stick together. This provides us with a temporary sense of being nourished, of being together. When we eat refined sugars, we get a spike in energy. But it's temporary, and once the sugars are rapidly taken up by our cells, our blood glucose levels drop, and we crash.

METABOLIC SYNDROME AND INSULIN RESISTANCE

One of the main causes of diabetes is *metabolic syndrome*, which can lead to insulin resistance, hypertension, abnormal lipids, inflammation, and *endothelial dysfunction*—when the lining of the blood vessels functions abnormally. This dysfunction then leads to arteriosclerosis, heart disease, strokes, and chronic kidney disease, among other conditions.

Simply put, metabolic syndrome begins with an overconsumption of too many refined sugars and/or saturated fats. This leads to the body's inability to clear these sugars and fats from its system quickly and efficiently. When the body holds on to excess sugars and fats, this excess is stored in the abdomen as adipose (fatty) tissue. This fatty tissue secretes inflammatory cytokines, leading to dysregulated metabolism and *insulin resistance* (an impaired response of the body to insulin), resulting in elevated levels of blood glucose. When this occurs, we get chronic, low-level inflammation

and oxidative stress.

The two main causes of insulin resistance are poor diet and lack of activity. When we eat a diet that is high in oxidized, saturated fats and simple carbohydrates, we are more likely to develop insulin resistance. When we don't exercise, glucose doesn't penetrate into the cell, causing an increase in glucose levels in the blood and disrupting mitochondrial function.

Sugars can also feed different fungi within the gut and encourage glucose-dependent bacteria. This means that the overconsumption of sugar not only leads to the host of problems associated with insulin resistance and diabetes—it can also lead to microbiome dysregulation, or abnormal changes in the population and function of healthy bacteria in the gut and body. Bacterial toxins from the microbiome can penetrate the bloodstream and enter other areas of the body, such as the gums. In fact, we often find that people with chronic dental infections, such as periodontitis, have an abnormal gut microbiome.

INTEGRATIVE TREATMENTS FOR DIABETES AND OBESITY

When metabolic syndrome and insulin resistance are not addressed, they will lead to diabetes. Many of the integrative strategies that are effective in treating diabetes and obesity are similar to the ones used in the treatment of cancer. The key is reducing inflammation and normalizing the cellular metabolism, and since metabolism is directly impacted by diet, making dietary changes is critical. Calorie restriction, intermittent fasting, and eating low glycemic foods all help in preventing and treating diabetes. Intermittent fasting in particular can improve diabetes outcomes. The

results include losing body weight, improved fasting glucose, and greater vitality.

In this section, I will discuss a variety of treatments that can work in tandem to improve metabolic function and, ultimately, nourishment.

MCP Treatment and Therapeutic Apheresis

Both type 1 and type 2 diabetes are affected by genetic and epigenetic influences, with varying levels of susceptibility on an individual basis. The currently accepted view is that in type 1 diabetes, an immune-mediated insult damages the cells that produce insulin in the pancreas, while a different, unknown insult causes type 2 diabetes. For example, a viral infection could result in type 1 diabetes, but in this case, the infection itself is not the cause—the *immune response* to the infection triggers the disease. Since the immune response is driven by galectin-3, I truly believe we can reverse and prevent type 1 diabetes if we can block or remove galectin-3 immediately after the initial insult to the pancreas.

In cases of type 1 diabetes, we may have to be more aggressive in our efforts to block galectin-3. We may need to do more than use MCP, because once the pancreatic cells (beta cells) are injured, they don't regenerate easily. However, it's important to remember that our bodies are always capable of change, and although these cells may be practically dead, they still have the potential for life. Adding to that hope is the evidence that we can regulate the immune response and reverse damage.

In such situations, I regularly incorporate therapeutic apheresis as a means to rapidly remove galectin-3 from the circulation in order to reduce the uncontrolled oxidative stress and inflammation. Galectin-3 binds directly to insulin receptors on the cell surface and inhibits downstream

insulin receptor signaling. It blocks the normal message for the cell to receive and process glucose, and it starts the process of insulin resistance. In the early stages of insulin resistance, the pancreas compensates by increasing the secretion of insulin into the bloodstream. The increase in insulin levels can cause weight gain, inflammation, and immune dysfunction. And as we know very well by now, the isolated environment that galectin-3 creates is fertile ground for multiple diseases.

Ketogenic Diet

For certain people with diabetes, a ketogenic diet can be beneficial under the proper medical guidance, and for others, it may be harmful. Since the ketogenic diet is high in fat, the foods that we choose while eating this way may not necessarily be healthy. Consuming too much unhealthy fat poses a health risk of its own because it can contain oxidized fats, damaging levels of toxins, and fat-soluble toxins like pesticides. Heavy metals can also bind to oxidized fats, and this toxin-laden belly fat can damage the surrounding organs, leading to fatty liver, hyperviscosity, and endothelial dysfunction.

If we choose the wrong foods, or nonorganic foods from unknown sources, a ketogenic diet can be damaging rather than helpful. If you consume animal fat, you want to make sure you select free-range animal sources that are free of hormones and antibiotics.

Being “ketogenic” means you have created an alternate metabolism that differs from a “normal” one. If being ketogenic was best to begin with, then it would have been our primary diet from the beginning. However, it’s an alternate emergency diet and should be considered as such. It can be used to treat and prevent conditions, and we must be skillful when implementing it. The most effective way to use this diet is to combine it with intermittent fasting. There is evidence that doing intermittent fasting

with or without a ketogenic diet for a short while, such as once a week, or even once a month, will create a positive shift in health and metabolism. Please refer to Appendix C for more information on the ketogenic diet.

Intermittent Fasting

Intermittent fasting activates a process called autophagy. The term *autophagy* is derived from Greek, meaning “eating of self.” Autophagy is a balancing response to different stressors and is critical for cellular repair and preservation. It’s an essential, homeostatic process in which cellular components are degraded and recycled in the cell and is a crucial defense mechanism against cancer, infection, and neurodegenerative diseases. Autophagy plays a role in removing abnormal proteins, clearing damaged organelles (the components inside the cells, such as mitochondria), as well as eliminating intracellular pathogens.

One way to induce autophagy is by restricting food intake, popularly known as intermittent fasting. This method upregulates autophagy in many organs, such as the liver and even the brain. Fasting causes human growth hormone (HGH) levels to increase and insulin levels to decrease. It also changes the expression of certain genes and initiates cellular repair processes. In addition, it increases metabolic rate and the release of the fat-burning hormone norepinephrine (noradrenaline). Other benefits of intermittent fasting include but are not limited to weight loss, reduction of inflammatory markers, improved heart and brain health, cancer prevention, and antiaging.

By spacing out meals, intermittent fasting uses time and space to promote healing. When there is more time between meals and more time between the activity of our digestive system, it allows for our digestive system and cells to repair themselves. The timing of the fasting is important. It is best to

start eating early in the day and begin the fasting earlier in the afternoon. An ideal example is to eat between 8 a.m. and 4 p.m.

Repair and healing take place during times of rest, and when we slow down and allow for greater space, it has profound healing effects on multiple levels, fundamentally changing our physiology in the process.

Exercise and Sleep

Moderate exercise can have an anti-inflammatory effect on the body. It positively affects the immune system, reduces glucose levels, and reduces the proinflammatory cytokines and chemokines in adipose tissue. When we exercise, we need to give the cells adequate recovery time between sessions. Otherwise, we produce reactive oxygen species. Extreme, competitive exercise is not always healthy for the long haul because competition creates its own form of stress on the system, so it's not something I recommend if the main goal is to improve or maintain health. Studies show that the stress created by extreme endurance training can cause gastrointestinal disturbances such as leaky gut, as well as fatigue, depression, and insomnia.⁴⁹

Another solution to help with diabetes is to establish sound sleep patterns and circadian rhythms. We can regulate our circadian rhythm by working during the day and creating complete darkness at night when we sleep. The darkness causes our melatonin to spike, and we will sleep better. This is also of great importance when it comes to the treatment of cancer, as melatonin inhibits the growth of a number of cancers.

There's an extensive link between exposure to heavy metals and environmental toxins and obesity, metabolic syndrome, and diabetes. Supporting the natural detoxification process helps to combat these

processes. We'll talk more about detoxification in an upcoming chapter.

Supplements and Herbs

There are different nutrients and herbs that can help with diabetes. Vitamin D, chromium, gymnema, jumbolin, fenugreek, berberine, medicinal mushrooms such as cordyceps and maitake, and honokiol derived from Magnolia bark can all be helpful in controlling diabetes. Specific protocols for different conditions, including metabolic syndrome, can be found in Appendix D.

Combining the methods outlined in this chapter can be very effective in preventing and reversing metabolic syndrome, insulin resistance, and even noninsulin dependent diabetes.

NOURISHING COMMUNITY

We must transform our point of view. We have been survival-focused. Instead, we must understand that when we nourish our surroundings, we nourish ourselves. From this perspective, the epidemics of metabolic syndrome and diabetes become reflections of the weakening of our connections as a community and society, and the weakening of what nourishes the earth. The knowledge and tools in this chapter have the power and ability not only to heal ourselves but to help us understand that our existence is not separate from our community. We can use these tools to heal that which is greater than individuals. And the beauty is that when we see it in such a way, when we don't have the need for immediate, tantrum-type nourishment, we effortlessly understand our connection to a greater reality.

Holistic healing doesn't only change us. It creates a level of harmony in the world. While many people want to find a physical solution by changing

their diet, true healing comes from understanding that just as our cells have relationships with each other, we too have relationships with each other. And in the same way that our bodies are nourished through our gut by what we eat and through our lungs by what we breathe, we are also sustained by the people around us. There is nourishment of the mind and heart through love and compassion. One of the key nourishments for metabolic syndrome is to recognize the difference between compassion and empathy—we must do more than understand one another by going farther to care for one another. This is why these tools are not only tools for healing ourselves but for healing our surroundings. As such, of course, we will naturally heal ourselves in the process.

⁴⁶ Corinna Hawkes “Uneven Dietary Development: Linking the Policies and Processes of Globalization with the Nutrition Transition, Obesity and Diet-Related Chronic Diseases,” *Globalization and Health* 2, no. 1 (2006): 4, <https://doi.org/10.1186/1744-8603-2-4>.

⁴⁷ CDC, *National Diabetes Statistics Report 2020*, accessed December 10, 2020, <https://www.cdc.gov/diabetes/pdfs/data/statistics/national-diabetes-statistics-report.pdf>.

⁴⁸ Moran Blaychfeld-Magnazi, Hilla Knobler, Hillary Voet, Naama Reshef, Shimon Weitzman, Anne E. Sumner, and Taiba Zornitzki, “Ethnic Variation in the Association of Hypertension with Type 2 Diabetes,” *Journal of Clinical Hypertension* 19, no. 2 (2016): 184–89, <https://doi.org/10.1111/jch.12883>.

⁴⁹ Allison Clark, and Núria Mach, “Exercise-Induced Stress Behavior, Gut-Microbiota-Brain Axis and Diet: A Systematic Review for Athletes,” *Journal of the International Society of Sports Nutrition* 13, no. 1 (2016), <https://doi.org/10.1186/s12970-016-0155-6>.

CHAPTER ELEVEN

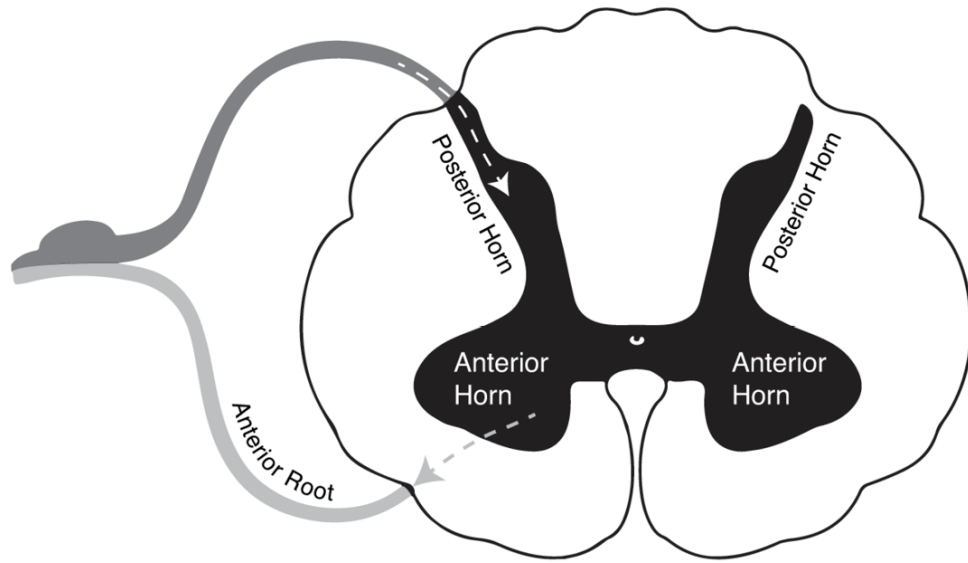
NEURODEGENERATIVE DISEASES

On this journey of exploring the role of galectin-3 in health and disease, we have discovered the basic metabolic and biochemical pathways that affect many conditions. Now, it's time for us to examine the big regulator—the system that gives us cognition, function, and control of our body: the nervous system. First, I will provide a primer on the basic function of this system so you can better understand later when we investigate potential problems that arise in the system as well as efforts to solve those problems.

The nervous system is divided into two parts: the *central nervous system* (CNS), which consists of the brain and spinal cord, and the *peripheral nervous system* (PNS), which consists of the nerves outside the brain and spinal cord. We can classify the PNS nerves into two different categories: *efferent* nerves (which send signals from the nervous system out to the body, giving us motor movement) and *afferent* nerves (which send signals from the body to the nervous system, providing sensory input).

If you look at a picture of the spinal cord, you might notice that it looks like a butterfly. Located at the front are the *anterior horns* on the left and right. These receive signals from the motor cortex in the brain and send them out to the body, thereby activating motor movement. For example, the anterior horns signal you to voluntarily contract or straighten your arm.

Spinal Cord Cross Section



A signal from the brain goes through the spinal cord to the anterior horn and then out into the body, resulting in motor movement. Sensory input from the body goes back to the posterior horn of the spinal cord. In a reflex response, input into the posterior horn stimulates the anterior horn directly without the need to travel to the brain.

The other part of the spinal cord, known as the *posterior horn*, is responsible for sensory experience. Let's use pressure and heat as examples. If you apply pressure to your hand, the afferent nerves receive the input through the posterior horn and send it through the spinal cord to the brain. The brain then produces a sensory response, and we will feel a sensation of pressure. Likewise, a similar process will happen with other sensations.

However, when the posterior horn receives information about extreme heat, such as touching a hot pan, it also facilitates an immediate motor reaction for you to withdraw your hand from the pan—without first traveling to the brain. From this, we can gather that certain sensations are processed through the brain, and others don't have enough time to travel

all the way through the system. The ones that don't take the full journey are commonly known as *reflexes*—these come through the posterior horn and immediately stimulate the anterior horn. Reflexes are actually quite primitive; they reflect our immediate, nonvoluntary survival response.

As is the case with reflexes, the survival response is built into the nervous system. The nervous system is an extremely complex system. Now that you know how some of the basic circuits in the nervous system function, let's investigate what happens when these functions degenerate.

WHAT EXACTLY IS NEURODEGENERATIVE DISEASE?

Our discussion of neurodegenerative diseases in this chapter will refer to conditions of the nervous system that develop over time as we “degenerate” with age, or due to other circumstances that can speed up the degenerative process, including a range of conditions that affect the neurons of the human brain, such as Parkinson's, Alzheimer's, ALS, and others.

Neurodegenerative conditions have some unmistakable similarities. They usually produce oxidative stress with a high level of reactive oxygen species (an oxygen-containing molecule that is highly reactive and can cause significant damage to cell structures). The inflammatory processes that result from the immune response can degrade the blood supply to the brain, causing damage to this organ. When this occurs, the brain, which consumes a large portion of our daily oxygen, has to find an alternate energy source, which, as we've discussed, results in oxidative stress and inflammation. This process can lead to the progressive degeneration and eventual death of brain and nerve cells.

Further, the nervous system can be affected by acute factors, such as infections, generalized inflammation, or exposure to toxins, which create

chronic responses similar to that of neurodegenerative diseases. A temporary, inflammatory immune response in the brain affects the CNS and can cause neurological disorders. It is of utmost importance to treat and heal these to prevent long-term damage. (Once an infection goes to the brain, it can cause short- or long-term damage, with examples being *Borrelia* in Lyme disease, *Babesia* in babesiosis, and other parasitic, fungal, or bacterial infections.) Although the initial immune response to infections is acute, it is not uncommon to see the immune response becoming chronic, and the chronic response in turn produces symptoms that are similar to that of a neurodegenerative disease.⁵⁰

GALECTIN-3'S CONNECTION TO NEURODEGENERATIVE DISEASES

So, what's the connection between galectin-3 and neurodegenerative diseases? Let's walk through the alarm and injury-repair process in the nervous system to illustrate this.

The cells that are in charge of cleaning up damage in the brain are called the *microglia*. They are the backbone of injury repair in the nervous system. Microglia assume responsibility as “damage sensors” for the neurological system. They are usually in a resting state in the normal adult CNS, but when we experience injury, trauma, disease, or infection in the CNS, they become active. The microglia guide the repair process in the brain, and activating them can be beneficial because they “clean up” the mess. However, under galectin-3's influence, the microglia can cause neuroinflammation. They become neurotoxic, causing dangerous upregulation of proinflammatory cytokines.

Astrocytes are another important group of cells in the nervous system.

They form the “skeleton” of the nervous system and help in system repair and cleanup as well. Microglia and astrocytes work together. They are both able to express high levels of galectin-3 in response to injury, just like inflammatory macrophages do in the rest of the body and the circulation. As a result, galectin-3 drives the injury response and creates the expected long-term consequences—inflammation and fibrosis, or a nervous system “scar.” A nervous system scar is different from a scar in the body. It is composed of reactive astrocytes that break away from the inflammatory core. The formation of this *glial scar* is enhanced by inflammatory cytokines that are driven by galectin-3.

Different neurodegenerative diseases will create such nonfunctional tissue in the central nervous system. For example, in Alzheimer’s disease, sticky clumps called *amyloid plaques* will form. Galectin-3 is present in dramatically higher concentrations in the amyloid plaques compared to the concentrations in normal CNS tissue. Researchers found that galectin-3 was highly upregulated in the brains of Alzheimer’s disease patients, showing that galectin-3 drives the formation of nonfunctional brain tissue.⁵¹

We must also consider the blood-brain barrier, which is of utmost importance because it protects the brain, determining what penetrates into the brain and what is kept out. Galectin-3 can weaken the blood-brain barrier, allowing pathogens and toxins to enter the brain, which is why we must minimize galectin-3 to prevent brain damage.

Let’s look at blood-brain barrier permeability. Under the influence of galectin-3, microglia secrete inflammatory cytokines. These turn the astrocytes neurotoxic.⁵² The neurotoxic astrocytes can cause a breakdown of the blood-brain barrier, meaning infections and bacteria can easily penetrate into the brain. But more importantly, these neurotoxic astrocytes

take part in the neurodegenerative process and are involved in multiple neurodegenerative diseases. In addition, some of the ligands that can be delivered to the injury site by galectin-3 can enhance damage from the neurotoxic astrocytes.

So, at the end of the day, why do these multiple degenerative processes occur? The brain is attempting to repair itself, but this can have detrimental results. It can leave behind scar tissue in the brain, an abnormal folding or accumulation of proteins, and a dysfunction in the CNS tissue. These are yet other manifestations of the survival paradox.

THE GUT-BRAIN CONNECTION

To fully understand the role of neuroinflammatory disease, we must consider the astonishing connection between the brain and the gut. A main function of the brain is to receive and process input. For example, when we try to learn content by reading it, that content gets put into the brain. Then the brain decides how to store it. It digests the information, files it, and makes it available through the process of recall, which is amazing. Recall allows us to clearly and vividly remember an event from years ago as if it just happened.

How is this possible? Because the brain *recreates the memory*, and it does this time and time again. In this sense, the brain is similar to the digestive system: it receives mental input, breaks it down, digests it, and sends it as messages via neurotransmitters and neuropeptides throughout the body where the information is utilized for different purposes.

And here is an amazing detail. The gut contains and excretes more neurotransmitters than the brain, and modern medicine has allowed us to discover the strong, logical gut-brain connection.⁵³ This connection is an

important one that has great influence on the body and the function of the nervous system. One example of the strength of this connection is the relationship between the vagus nerve (which extends from the brain stem to the digestive tract) and Parkinson's disease.⁵⁴ Some research even indicates that Parkinson's disease may begin in the gastrointestinal tract, traveling to the brain through the vagus nerve.⁵⁵

TREATMENTS FOR NEURODEGENERATIVE DISEASES

For a long time, we thought that neurons never divided or repaired themselves again after a certain number of years, but we've discovered that this is not true. This means that people can recover from nervous system issues, and people with degenerative diseases can theoretically reverse them!

The most promising new finding in the area of brain regeneration came about from research that was conducted at Yale University in 2018.⁵⁶ Researchers discovered that the brains of adult monkeys continued to produce new neurons. There was also evidence that older men and women in good health could generate as many new brain cells as people who were much younger!

To heal neurodegenerative diseases, we want to stop or prevent the abnormal inflammatory process and oxidative stress. We can turn to an anti-inflammatory diet and supplements, just like we have for other conditions previously discussed in this book. We want to use herbs that help regulate the nervous system's metabolic processes. One of the most important natural compounds we can take is honokiol from *Magnolia officinalis*. Honokiol penetrates the blood-brain barrier and can normalize

and regulate intracellular, metabolic, and mitochondrial function.

It is also important to recognize the influence of the gut and microbiome on the brain and nervous system.⁵⁷ We can support microbiome health by giving prebiotics and probiotics, with prebiotics being especially impactful because they provide necessary nourishment for healthy probiotic growth. We also want to have appropriate fiber intake and address any infections in the gut. We can provide neurotransmitter support with different B vitamins such as B12, B6, B1, B2, tyrosine, threonine, phosphatidylserine, and certain medicinal mushrooms like cordyceps and reishi. We can also use herbs like ginkgo biloba.

If a patient has neurodegenerative issues due to a weak antioxidant system or deficiencies in vital components of the antioxidant system, they can very often be properly counteracted simply by taking antioxidants. For these patients, we can administer specific intravenous treatments, including intravenous glutathione (our systemic master antioxidant), to produce significant benefits. This is also where I will incorporate therapeutic apheresis as a means to reduce the uncontrolled oxidative stress and inflammation.

The brain is an organ. However, like a muscle, it needs exercise. Physical exercise benefits the brain on numerous fronts, and I recommend exercises that require coordination such as ballroom dancing, tango, and Tai Chi, as well as mental exercises, like doing puzzles. Even mild exercise for a mere ten minutes has been demonstrated to improve neurocognitive function.⁵⁸ Supporting the gut-brain connection through exercises that engage the vagus nerve—especially slow, deep breathing—can help both the gut and the brain.⁵⁹

In my clinical experience, patients with severe dementia and Alzheimer's

who implement these solutions stabilize or improve significantly. I want to make it clear that implementation doesn't mean that every neurodegenerative disease will be reversed, but anything is possible. We know that people with neurodegenerative diseases do have the potential to heal and live longer, with a better quality of life.



ANDY'S STORY

Andy Aubin was a dear patient that I treated for many years. He was seventy years old when he came to see me for localized prostate cancer that was accompanied by advanced Parkinson's disease. We were just beginning his treatment when he was hospitalized with a ruptured colon due to a newly diagnosed stage 4 metastatic colon cancer that had metastasized to the liver. He underwent emergency surgery that included the removal of part of his colon, some of the tumors from his liver, and a colostomy.

After the surgery, he was given the first dose of the follow-up chemotherapy regimen, and he had a severe reaction to the chemotherapy. His Parkinson's disease deteriorated dramatically, and he went into a state of extreme physical rigidity. He was practically unable to move.

Andy knew that one more dose of chemotherapy could be a death sentence for him, so he decided to rely on the nonconventional part of integrative medicine, as he could no longer undergo conventional cancer treatments.

Treating stage 4 colon cancer and prostate cancer while addressing a

severe neurodegenerative disease is next to impossible. It's often the case that a treatment that can kill cancer will worsen the neurodegenerative disease. But Andy had faith on his side. He had faith in his power to heal, faith in the treatments we offered him, and he had faith in me. He also had unwavering discipline.

Andy began treatment believing that he could overcome and heal from his diseases. His treatments included high doses of MCP, multiple supplements and herbs, different IV regimens, acupuncture and healing sessions with me, and lifestyle changes. Over time, Andy's cancer disappeared. And in the healing process, his Parkinson's remarkably improved as well.

In a video filmed *twelve years after he first came to the clinic*, Andy, who was eighty-two at the time and still working on his farm, is shown break-dancing with his wife. He's also shown moving a computer mouse, a refined coordination movement that is typically impossible for Parkinson's patients to perform.

Andy overcame an incurable neurodegenerative disease *while overcoming two cancers at the same time*. Thirteen years after his first visit to the clinic, he died at the age of eighty-three, for reasons unrelated to Parkinson's or the cancers. He lived a full and happy life through the miracle of regeneration and healing. His story was so amazing that it was documented by an international television health program. The video can be viewed on SurvivalParadox.com.

IT'S NEVER TOO LATE

It's important to remember that neurodegenerative diseases are multifactorial. They are driven by genetic and epigenetic influences, by

environmental influences such as heavy metal and neurotoxins present in the environment and in our foods, and by lifestyle and dietary habits. When we address these multifactorial issues, we can create beneficial change. While sometimes these changes may be mild, at other times, they can be dramatic. A person can even overcome long-term, brain-related symptoms that are the result of deep genetic or epigenetic traits you would not expect to change.

I had such a patient. This patient had an exceptional memory for details, but for some reason, he couldn't remember people's names. It was interesting because his mother and siblings had the same issue. Was it a genetic predisposition? Was it an epigenetic influence stemming from a multigenerational trend of not remembering the names of others? Or was it perhaps due to the fact that the family lived forty yards away from tall power lines for many years?

Regardless of the cause, addressing the outcomes of increased oxidative stress in the brain can help. This patient started taking fifteen grams of MCP per day, supported his circulation with botanical formulas, and underwent a series of monthly therapeutic apheresis treatments in the clinic. And while he hasn't become a champion in remembering the names of every single person he meets, he's clearly improved, overcoming an issue he's had for over thirty years.

I can tell you this story because I know this patient very well. *This patient was me!*

The nervous system is an incredibly sophisticated communication hub. Malfunctions of this system are literal manifestations of the dangers associated with breakdowns in connectivity.

⁵⁰ Fabiana Novellino, Valeria Saccà, Annalidia Donato, Paolo Zaffino, Maria Francesca Spadea,

Marco Vismara, Biagio Arcidiacono, Natalia Malara, Ivan Presta, and Giuseppe Donato, "Innate Immunity: A Common Denominator between Neurodegenerative and Neuropsychiatric Diseases," *International Journal of Molecular Sciences* 21, no. 3 (2020): 1115, <https://doi.org/10.3390/ijms21031115>.

⁵¹ Chih-Chieh Tao, Kuang-Min Cheng, Yun-Li Ma, Wei-Lun Hsu, Yan-Chu Chen, Jong-Ling Fuh, Wei-Ju Lee, Chih-Chang Chao, and Eminy H. Y. Lee, "Galectin-3 Promotes A β Oligomerization and A β Toxicity in a Mouse Model of Alzheimer's Disease," *Cell Death & Differentiation* 27, no. 1 (2019): 192–209, <https://doi.org/10.1038/s41418-019-0348-z>.

⁵² Jian Jing Siew, Hui-Mei Chen, Huan-Yuan Chen, Hung-Lin Chen, Chiung-Mei Chen, Bing-Wen Soong, Yih-Ru Wu, et al., "Galectin-3 Is Required for the Microglia-Mediated Brain Inflammation in a Model of Huntington's Disease," *Nature Communications* 10, no. 1 (2019), <https://doi.org/10.1038/s41467-019-11441-0>.

⁵³ Emeran A. Mayer, "Gut Feelings: The Emerging Biology of Gut-Brain Communication," *Nature Reviews Neuroscience* 12, no. 8 (2011): 453–66, <https://doi.org/10.1038/nrn3071>.

⁵⁴ Elisabeth Svensson, Erzsébet Horváth-Puhó, Reimar W. Thomsen, Jens Christian Djurhuus, Lars Pedersen, Per Borghammer, and Henrik Toft Sørensen, "Vagotomy and Subsequent Risk of Parkinson's Disease," *Annals of Neurology* 78, no. 4 (2015): 522–29, <https://doi.org/10.1002/ana.24448>.

⁵⁵ Uwe Walter, Panagiota Tsiberidou, Maxi Kersten, Alexander Storch, and Matthias Löhle, "Atrophy of the Vagus Nerve in Parkinson's Disease Revealed by High-Resolution Ultrasonography," *Frontiers in Neurology* 9 (2018), <https://doi.org/10.3389/fneur.2018.00805>.

⁵⁶ Alvaro Duque and Reynold Spector, "A Balanced Evaluation of the Evidence for Adult Neurogenesis in Humans: Implication for Neuropsychiatric Disorders," *Brain Structure and Function* 224, no. 7 (2019): 2281–95, <https://doi.org/10.1007/s00429-019-01917-6>.

⁵⁷ Clair R. Martin, Vadim Osadchiy, Amir Kalani, and Emeran A. Mayer, "The Brain-Gut-Microbiome Axis," *Cellular and Molecular Gastroenterology and Hepatology* 6, no. 2 (2018): 133–48, <https://doi.org/10.1016/j.jcmgh.2018.04.003>.

⁵⁸ Kazuya Suwabe, Kyeongho Byun, Kazuki Hyodo, Zachariah M. Reagh, Jared M. Roberts, Akira Matsushita, Kousaku Saotome, et al., "Rapid Stimulation of Human Dentate Gyrus Function with Acute Mild Exercise," *Proceedings of the National Academy of Sciences* 115, no. 41 (2018): 10487–92, <https://doi.org/10.1073/pnas.1805668115>.

⁵⁹ Sigrid Breit, Aleksandra Kupferberg, Gerhard Rogler, and Gregor Hasler, "Vagus Nerve as Modulator of the Brain-Gut Axis in Psychiatric and Inflammatory Disorders," *Frontiers in Psychiatry* 9 (2018), <https://doi.org/10.3389/fpsy.2018.00044>.

CHAPTER TWELVE

IMBALANCES OF THE IMMUNE SYSTEM

Immunity is a fundamental function of the body and something that many people are rightly concerned about. The immune system is our protector, shielding us from outside invaders as well as ones that develop inside the body. First, let's examine how immunity functions and develops.

Every cell in our body has a certain marker that helps the cell recognize itself as part of the system, and helps the body recognize the cell as a part of itself so that the body doesn't attack the cell. This is controlled by a sophisticated recognition system called *major histocompatibility complex* (MHC), which makes it difficult for pathogens to evade immune responses.

Some immune learning processes begin in utero while the immune system develops, but for the most part, we are immune naive at the beginning of our lives. We aren't exposed to bacteria or pathogens inside the womb, so our immune system requires training.

Our immune training starts when we're first exposed to our mother's microbiome and its bacteria during our birth, and continues when we breastfeed since we're exposed to different molecules and compounds in our mother's milk. The immune system develops throughout childhood, with childhood illnesses serving as a training ground for the immune

system. When a child is exposed to an illness, this exposure teaches the immune system how to create a robust response. Then the response turns off and life goes on. At least, this is how it's supposed to happen.

Children who play in the dirt, get exposed to other children, and get exposed to colds will have less asthma, allergies, and incidence of chronic disease because their immune systems are properly trained.⁶⁰ Children who are kept in isolation and not exposed to germs end up with compromised immune systems and are more likely to have chronic conditions such as asthma.

We must be exposed to outside bacteria, viruses, and parasites, but there are also certain natural compounds that can help train and build the immune system, allowing its innate and adaptive functions to develop. For example, the polysaccharides, glycoproteins, and phospholipids contained in medicinal mushrooms can all be very helpful. Taking MCP can be helpful as well.

The body has multiple barriers of protection, such as the skin, the cornea of the eyes, and the respiratory, gastrointestinal (GI), and genitourinary (GU) systems. These physical barriers are the body's first line of defense, and some of them even have active immune functions. For instance, the mucous in the mucosa layers of the respiratory, GI, and GU systems contain antimicrobial substances. These barriers help to keep external threats outside of the body.

But what happens when we threaten ourselves internally with destructive emotions and destructive psychology? The immune system still responds! The body and our nervous system can create trauma-induced and survival-driven responses that are the best immediate solution for us when faced with a threat but are not suitable for us in the long run. When we get stuck

with such fixations and trauma-driven responses, it can result in damaging outcomes psychologically, mentally, and physically. This can lead to autoimmune diseases and many other unhealthy conditions that are the by-product of the survival response.

WHAT IS AUTOIMMUNITY?

Autoimmunity is an inappropriate immune reaction toward the body or toward certain organs within the body. In this reaction, the immune system attacks the body rather than protecting it. It doesn't recognize the body as "self" but rather perceives it as "other," and it unleashes the survival response and the inflammatory cascade. This can express itself in a variety of diseases, such as rheumatoid arthritis, scleroderma, and many others. But the issue of autoimmunity goes beyond simple physical and biochemical responses.

Identifying Self and Others: The MHC Protein Complex

The immune system identifies distinctive molecules present on the surface of cells, called major histocompatibility complex molecules (MHC class I). Based on the MHC identification, it recognizes them as "self," while it identifies foreign materials as "nonself." Any substances recognized as foreign are classified by the immune system as antigens and trigger an immune response. Antigens are recognized by lymphocytes (one of our immune cells) and trigger the production of antibodies, which specifically bind to them. This immune response eliminates intruding material from the body and is also known as adaptive immunity.

Strong innate immunity means that we are able to protect ourselves when necessary without attacking ourselves. When we have this healthy balance, we become less reactive—both within the body and toward the

outside world. We are better able to discern between real and perceived threats and, as a result, judge and overreact less. Being within a community helps us create relationships of mutual respect, which in turn influence our bodies all the way to the level of the microbiome.

The skin, the cornea, and the mucosal membrane are our physical protective barriers, which utilize the innate immune response. If the innate immune system works well, you don't need to recruit the adaptive system as often. This is what we want, since the adaptive system is the one that responds to challenges through the survival response and is connected to the involvement of galectin-3.

Adaptive and Innate Immune Systems

The fast-acting, *innate* (general immune system) and the *adaptive* (specialized immune system) work closely together to take on different tasks. The innate system is not dedicated to specific pathogens; thus, it does not need a long startup phase, but it can only block germs from entering and spreading throughout the body to a certain degree. The adaptive system is specialized in creating a specific response that is long-lasting, an example being long-lasting immune protection in response to a successful vaccine.

Healthy communities take care of each other. If something is wrong, they alert one another, and the same happens between the cells of our body. But if it's every cell for itself and the cells don't care what happens to one another, we'll encounter trouble. The cell perceives a need for self-preservation, and this is not a healthy immune response because it doesn't consider the body and the person as a whole.

Autoimmune issues can also result from exposure to toxins. They can develop post infection and can be affected by genetic and epigenetic

influences. The body recognizes the infectious agent or toxin, but the body responds to it by mounting an immune response *against the body*—we lose the harmony inside our bodies, and we begin to self-destruct. Autoimmune responses can also be triggered by emotional and psychological stresses. Internal struggles can manifest in certain organs and organ systems in the body, leading to autoimmune issues.

Every autoimmune condition has a unique, complex pattern of immune dysregulation, but galectin-3 is almost universally involved with autoimmune diseases. For example, galectin-3 plays a role in the body's recognition of self and nonself, such as foreign invaders that have to be eliminated. Interestingly, this not only impacts autoimmune diseases—it also impacts organ transplants. Galectin-3 is involved in organ rejections, where the body rejects the newly transplanted organ, as well as in graft versus host response (GVH), a condition where the cells of the transplanted organ or bone marrow attack the “host,” the body.⁶¹

TREATMENTS FOR THE IMMUNE SYSTEM

Inflammation, aging, and genetics are all linked with the decline of the immune system. The natural process of *immunosenescence* is the gradual deterioration of the immune system brought on by age advancement. All of the wear and tear of inflammation causes your immune system to decline with age, in addition to other factors like genetics, epigenetics, and lifestyle. It's inevitable, and eventually we all decline in functionality and die. However, understanding the process and what drives it offers us the ability to have some control over it and improve the outcome.

When we look at improving the immune system, there's much that can be done. Enhancing the health of the different contributors to the immune

system will help. For example, the digestive system is an integral part of the immune system, so it's important to have a healthy microbiome and gut barriers. In this section, we will discuss a variety of therapies and healthy habits that can improve immune system function.

Diet and Exercise

When it comes to supporting immune health, we need to emphasize an anti-inflammatory diet. This leads not only to a reduction in the inflammatory response but will also support healthy function of the cell membrane and its receptors. When the extracellular space is in an inflammatory state, galectin-3 gets activated and binds to specific receptors on immune cells called CD 45 receptors. This shuts down the immune response and the excretion of cytokines. (Although an excessive production of cytokines is dangerous, as we discussed in our explanation of cytokine storms, some excretion of cytokines is healthy and is necessary for proper immune response.)

Exercise and proper hydration are also important parts of an immune support program. They help reduce inflammation and improve oxygen delivery to the different tissues, which improves the overall function of the immune system.

Medicinal Mushrooms and Herbs

Medicinal mushrooms, such as reishi and cordyceps, are different from herbs and are renowned for their support of the immune system. They have a unique, built-in adaptogenic quality and an affinity for areas of stagnation, areas the body determines to be problematic, and areas that are not under the body's regulatory systems. Malignant tumors are a classic example. They're very active metabolically, and are no longer regulated by

the body—medicinal mushrooms have a specific affinity for them.

Medicinal mushrooms have the ability to impact our past, present, and future. They break down tissue and absorb and remove toxins, thus “cleaning up” deposits from the past and creating an antifibrotic effect. This will prevent long-term side effects from past insults. They have a real-time effect in the present by enhancing our immediate immune response. And they affect the future by training the immune system to better respond going forward. An example of a mushroom helping to clear the past is cordyceps, which prevents kidney damage from aminoglycoside antibiotics or from cyclosporine, an immunosuppressive drug. Reishi, another medicinal mushroom, also helps prevent liver damage from progressing to liver cirrhosis.⁶²

Given the multifaceted effects of medicinal mushrooms, people won’t develop a tolerance to them. These mushrooms provide long-term support for the immune system. I myself have experienced this long-term benefit. I’ve been using my mushroom formula—which I grow on immune-enhancing herbs—for the past twenty years. All this time, I’ve been reaping the health benefits they have provided.

There are also a number of herbs that can support immune function. Leading the way is astragalus (Huang Qi). It is one of the key herbs that I use to grow the mushrooms for my immune mushroom formula. These herbs can work well with MCP and medicinal mushrooms, and I often combine them for immune support.

MEDICINAL MUSHROOMS AND MCP AS PREBIOTICS

I usually advise my patients to combine MCP with medicinal mushrooms for synergistic digestive and immune support. Medicinal mushrooms act as a powerful prebiotic because they contain a mixture of different oligosaccharides.

They also contain mushroom-based proteoglycans that play a vital role in immunomodulation and antitumor activities.

The pectic-oligosaccharides (POS) contained in modified citrus pectin are also a new class of prebiotic capable of exerting many health-promoting effects.

Prebiotics create a desirable fermentation profile in the gut. They have been shown to have in vitro anticancer properties, as well as provide cardiovascular protection. Studies have confirmed that these POS possess antibacterial, anti-inflammatory, and antioxidant properties, among others.

Psychological and Emotional Awareness

Just as the body can turn against itself and create an autoimmune condition, so too can our body react negatively when we get “stuck” in unsupportive or destructive patterns. When we recognize “stuck” patterns, we have an opportunity to release them and restructure our memory and neural response. The choice and the power to do so is in our hands. Negative thoughts, destructive emotions, psychological patterns, and unwanted habits can melt away because we no longer need them for survival. This process can also improve our immune response, resulting in a more efficient and balanced immune system.

A good first step is to develop awareness of your actions and what drives them. When you take action and do something that will benefit the greater good, it's a response that benefits you and the community. However, taking action based on the sole purpose of self-preservation only promotes wear and tear and shortens our lives. For example, taking action for global climate change because you feel threatened, upset, and angry about it is one thing, but taking action because you are concerned for the earth and the people of this planet is another. The first motivation is survival-driven. Feeling threatened and upset causes a sympathetic response: our blood pressure goes up, our circulation is more turbulent, damaging inflammatory

compounds increase, and we can even feel the heat in our face and tension in our body. The second motivation is much healthier, and is for the greater good of the community. Internally and externally, there is greater harmony.

The famous Jewish sage Hillel the Elder summed up the paradox between caring for self versus others in the first century AD when he wrote, “If I am not for myself, who will be for me? But if I am only for myself, who am I?”

After all, the heart nourishes itself while nourishing the entire body on an ongoing basis. The two can never be separated.

A WORD ABOUT ALLERGIES

What are allergies, exactly? They are an inappropriate immune response to stimuli from outside the body. In general, people can be allergic to different foods, or they can be hypersensitive to the environment. Metaphorically, such individuals don't have strong barriers or boundaries, and their bodies generate a hyperimmune response. In other words, the body believes that these outside stimuli will harm it even when they may not.

An allergic response occurs when the survival alarm turns on unnecessarily. To illustrate by way of analogy, let's say you are sitting outside and you see movement from far away. It's so far away and moving so slowly that it may never even reach you, but your body is already responding to it as a threat. This is the body's “thought process” with allergies.

When we have great anxiety about the future, it can manifest in our body, and when it's directed outwardly, it can also become a kind of allergic response. For example, when we work on a project that has ten steps and we're on step number two, there's no point in worrying about step number

ten at that moment, right? But our mind tends to go there. We are aware of all the steps and what each one entails, and our innate immune system is aware of them also. It's a highly intelligent system, but rather than trusting in it, we are anxious about step ten when we've only just begun. In reality, *we may never even make it to step ten*. This is not an appropriate response, and the immune system reacts to this stress.

We can also have emotional or psychological “allergies,” and eventually, they have a physical impact on us. For example, someone with PTSD who is constantly reminded of their trauma is always in a state of high stress. Such an individual will have a strong, immediate response to stimuli reminiscent of the original trauma, even if the current stimulus no longer carries the same threat. This takes a toll on both body and mind. The response of someone with PTSD is often automated; it's driven by the autonomic nervous system, and the response doesn't turn off.

On the other hand, some people can have an inert immune response, meaning their systems don't respond when needed. We call this *anergy*, or the lack of an appropriate immune response. And guess what? Both the hyper response and lack of response can be affected by galectin-3. Galectin-3 can trigger a hypersurvival response that expresses itself as an allergic response. Or it can help an invader evade the immune system, causing a lack of immune response by the host, the body.

Allergies and Cancer

Research shows that certain cancers won't thrive in people who have chronic hay fever or allergies because their immune system is constantly on the alert and fighting off invaders.⁶³ It recognizes cancer cells immediately and goes to work defending the body, but it can leave behind a lot of destruction and inflammation in the process.

This is not as straightforward in patients with autoimmune disease, as cancer's chance for survival is more unpredictable in these patients. There can be a strong immune response by the body to fight the cancer, but sometimes the cancer will thrive due to the ongoing, internal destructive qualities of inflammation.

MOVING TOWARD RESILIENCE

The popular media is always putting forth lists of things to “avoid”—such as certain foods, lotions and potions—all under the guise of helping us get healthier. So the first thing most of us try to do is to avoid a specific food. For example, if someone has an allergy or digestive intolerance to dairy or gluten, they go dairy or gluten free to try and improve their condition. However, getting to a place where you can actually eat something that you weren't able to eat before can signify true improved health. Increased tolerance indicates that the body is stronger, and it's one of the surest signs of health.

Resilience is the ability to effectively adapt to and recover from adversity. A resilient immune system is one that responds *appropriately*; it can adapt its response based on the stimulus. For example, a resilient immune system will respond strongly when needed without harming the body. It will respond less actively for lesser threats, sustaining a more passive immune response without overactivating, such as in the case of allergies. Having a resilient immune system allows us to move from surviving to thriving.

Interestingly, *psychological* resilience—the capacity to easily adapt to circumstances and recover from adverse stressors and events—has been found to have a positive effect on the immune system.⁶⁴ This underscores the direct relationship between the mind and immune responses: if we can

improve our internal state of mind, it will have a positive effect on our immune system.

Our immune system is an intricate and complex system with multiple influences from different parts of the body and the environment. Over the last few years, we've come to recognize that a key factor in healthy immune function, and our health in general, is developing healthy and supportive relationships with the guests that reside in the body within the microbiome. This brings us to the next chapter.

⁶⁰ Jack Gilbert, Rob Knight, and Sandra Blakeslee, *Dirt Is Good: The Advantage of Germs for Your Child's Developing Immune System* (New York: St. Martin's Griffin, 2019), <https://us.macmillan.com/books/9781250132604>.

⁶¹ Zachariah Defilipp, Nalu Navarro-Alvarez, Shuli Li, Alec R. Andrews, Ariel Johnson, Yi-Bin Chen, Vincent T. Ho, Jerome Ritz, Thomas R. Spitzer, and Christene A. Huang, "Elevated Galectin-3 Plasma Concentrations in Recipients of Allogeneic Hematopoietic Cell Transplantation," *Clinical Hematology International*, 2019, <https://doi.org/10.2991/chi.d.190823.001>.

⁶² Wen-Chuan Lin and Wei-Lii Lin, "Ameliorative Effect of Ganoderma Lucidum Carbon Tetrachloride-Induced Liver Fibrosis in Rats," *World Journal of Gastroenterology* 12, no. 2 (2006): 265, <https://doi.org/10.3748/wjg.v12.i2.265>.

M.g. Shashidhar, P. Giridhar, K. Udaya Sankar, and B. Manohar, "Bioactive Principles from Cordyceps Sinensis: A Potent Food Supplement—A Review," *Journal of Functional Foods* 5, no. 3 (2013): 1013–30, <https://doi.org/10.1016/j.jff.2013.04.018>.

Shuang Zhao, Qi Gao, Chengbo Rong, Shouxian Wang, Zhekun Zhao, Yu Liu, and Jianping Xu, "Immunomodulatory Effects of Edible and Medicinal Mushrooms and Their Bioactive Immunoregulatory Products," *Journal of Fungi* 6, no. 4 (2020): 269, <https://doi.org/10.3390/jof6040269>.

⁶³ Renata Kozłowska, Andrzej Bożek, and Jerzy Jarząb, "Association between Cancer and Allergies," *Allergy, Asthma & Clinical Immunology* 12, no. 1 (2016), <https://doi.org/10.1186/s13223-016-0147-8>.

⁶⁴ Flurin Cathomas, James W. Murrough, Eric J. Nestler, Ming-Hu Han, and Scott J. Russo, "Neurobiology of Resilience: Interface Between Mind and Body," *Biological Psychiatry* 86, no. 6 (2019): 410–20, <https://doi.org/10.1016/j.biopsych.2019.04.011>.

CHAPTER THIRTEEN

IMBALANCE OF THE MICROBIOME

Much like humans, different bacteria and fungi have evolved over billions of years, and these agents are not necessarily virulent or pathogenic by nature. It's amazing to think that there are 100 trillion microorganisms living within us, and they comprise 90 percent of the DNA material in our bodies.⁶⁵ Most of these microorganisms reside in our gut in a highly populated environment known as the *microbiome*, which has a tremendous influence on our life and health.

In a healthy person, the trillions of bacteria living in our gut exist harmoniously. They are in a state of equilibrium with their human host. The microbiome reflects the concept of community. The well-being of the host depends on this community of microorganisms serving their individual and collective roles, much like the survival of a beehive depends on the community of bees working together like a single organism.

Each of us is also part of a larger community, and just like our microbiome, our communities thrive when we work together as a whole. While we may labor under the illusion that we are solitary and independent beings walled off from our environment, we are in close touch with other organisms every moment of our lives. We can make the choice either to live in harmony with the larger world or suffer the distress created

by an isolation mindset.

HOW THE MICROBIOME FUNCTIONS

By the time we are four years old, the characteristics of our gut and microbiome are well established. The process by which this happens is similar to how we learn behaviors early in life: the microbiome “learns” through food and lifestyle, and once it’s been established, it’s not easy to change.

Naturally and practically, we have a fascinating and intricate relationship with our microbiome. When the microorganisms in our gut exist in harmony with each other and the body, all parties benefit. However, when the microbiome is out of balance and we harbor bacteria that aren’t supposed to be there, these agents start to overgrow. They not only affect the digestive system but the whole body, and more specifically the nervous system.

Research has made it very clear that in order to remain healthy, we need to understand and respect the microbiome. We absorb nutrients through our gut so that the nutrients can become part of our body, and much of that nutrient absorption is activated by bacteria.⁶⁶ The microbiome is of great importance to humans, and the relationship we have with it must be one of harmony, communication, mutual respect, and support.

Early Influences on the Microbiome

It may not be widely known that the nutrition of a mother before and during pregnancy has a great influence on the health of a child’s microbiome. A baby’s gut is sterile at birth, but genetic tendencies are present, and the newborn gut is populated with microorganisms within hours.

Remarkably, the delivery method of the baby also has an impact on the gut of a child. When babies are delivered vaginally, they are exposed to natural bacteria in the birth canal. Vaginal and intestinal flora are very similar, so vaginal delivery can be a valuable first step to gut health.⁶⁷ Although the way a child is delivered is not always within our control, vaginal delivery should be selected when possible.

The nutrition of the mother during the first one to three years of a child's life is also extremely important, and healthy lactation and breastfeeding are big contributors to the microbiome's health and viability. There are important bacteria in the milk such as *L. reuteri* that help establish microbiome health. Babies who don't breastfeed tend to have more colic, gas, and digestive problems.⁶⁸

Before we became aware of breast milk's influence on microbiome health, we simply thought that formula was harder on young, delicate digestive systems, but the implications are now much greater than this. Breastfeeding is an important determining factor in establishing a healthy microbiome for life. The contribution of mother's milk to the microbiome is a complex and fascinating area of ongoing research.

Importance of the Gut Boundary

There is a strong connection between abnormalities in the microbiome and different diseases. The gut boundary is one that stands between us and all of the bacteria within it. If our gut were to open up and its contents spilled into the body, we would die within hours because we'd develop sepsis (a dangerous systemic response to infection). This is why gut perforations are such a serious matter. It's crazy to think the bacteria that are essential for our health while within the gut are the same bacteria that will kill us if allowed to flow freely inside the bloodstream.

Our digestive tract is a hollow tube that starts in the mouth and ends at the anus. If we think about it, until we absorb something from the lumen (the hollow space) of the digestive tract, through the intestinal lining, and into the body, it's not really part of the body. In the same way, it's intriguing to recognize that although the bacteria in the gut reside inside the body, in many ways, they are actually *outside* of it because they are isolated in the gut lumen, surrounded by the gut lining.

THE MICROBIOME IN CRISIS

When the microbiome is balanced and what we eat nourishes the bacteria, there is a healthy process and communication between the microbiome and the body. However, when there is a crisis in the gut and the microbiome feels threatened, the symbiotic relationship between the microbiome and the body is disrupted, and the area in crisis isolates itself. It does this by creating a coating around itself, known as a *biofilm*. This biofilm consists of different layers and components, and a key component of the biofilm skeleton is galectin-3.

When the microbiome senses a crisis like an infection, or receives a message that something is wrong, galectin-3 is mobilized very quickly. Galectin-3 is used by our body within the microbiome's boundaries to protect against infection, but this can result in an uncontrolled immune response and inflammation. We end up with chronic inflammation and damage, which can create an imbalance that allows bacteria that are not part of the natural gut community to grow stronger.

Research shows that galectin-3 helps pathogenic bacteria survive and adhere to the gut lining, allowing harmful molecules to flourish and penetrate into the body, bloodstream, and lymphatic system. This creates

abnormal reactions, autoimmune disease, neurodegenerative and neuroinflammatory disease, and can even lead to sepsis.

Another concern is the overuse of antibiotics. When foreign components or damaging infections are present in the gut and we try to kill them by using antibiotics, we also kill some of the healthy bacteria in the gut. As a result, we disrupt the microbiome, and another population of bacteria takes over. It is almost as if the microbiome *knows* that it must be populated and responds accordingly. Healing the microbiome can be a challenge because the use of certain antibiotics can encourage the growth of unhealthy populations of bacteria. Antibiotics are a double-edged sword. They may be essential to counter serious bacterial infections, while at the same time, their use disrupts the balance of the microorganisms in the gut.

There is also debate in the medical community as to whether or not probiotics are beneficial during and after antibiotic therapy. We might create new problems by superimposing bacteria and not allowing endogenous bacteria to flourish and achieve homeostasis. As I've explained, from my perspective and clinical experience, it's essential to combine the use of probiotics with prebiotics, to support a healthy and thriving microbiome environment.

Dysbiosis

Dysbiosis is an imbalance between different microorganisms present within our microbiome. This imbalance can be a result of a deficiency in our microbial flora, lack of variety in the healthy flora, or the establishment of microbial pathogens and opportunistic bacteria.

Unhealthy bacterial by-products can damage the thin lining of the intestinal mucosa and adversely affect our well-being. The use of

antibiotics, stress, eating an unhealthy diet, exposure to pesticides (especially glyphosate), and the makeup of our personal intestinal microflora have been found to contribute to intestinal dysbiosis. These factors are influenced by our modern Western lifestyle.

Dysbiosis disrupts energy balance and immune reactions, contributing to damage to the mucosal lining and resulting in a condition often known as “leaky gut,” which we will discuss in greater detail later in this chapter. This loss of intestinal barrier integrity allows the migration of undigested food particles and microbial by-products into the systemic circulation, resulting in chronic inflammation and an abnormal systemic immune response. Intestinal dysbiosis is associated with irritable bowel syndrome, Crohn’s disease, ulcerative colitis, small intestinal bacterial overgrowth (SIBO), rheumatoid arthritis, chronic fatigue syndrome, and even autism spectrum disorder.

The Microbiome’s Influence on Cancer

Given the importance of a healthy microbiome for our well-being, it’s not surprising that dysbiosis is linked to chronic inflammation and aging, often referred to as *inflammaging*. Abnormal bacterial growth is also a factor in the occurrence and progression of different cancers. The microbiome contributes to our survival as a whole, and it can have a profound influence on the effectiveness of cancer treatments. Aided by the inflammatory process, the microbiome initiates a proto-oncogenic, cancer-contributing microenvironment. The question is, are the microbes a promoter or a consequence of the cancer? They can be both. Components of the microbiome can promote the cancer process. At the same time, as the cancer produces an abnormal and skewed environment, healthy bacteria aren’t able to grow.

Increasing evidence supports the notion that the content of the microbiome determines whether or not a patient will respond to chemotherapy and immunotherapies. When we have a healthy microbiome, we are better able to utilize cancer-killing drugs.⁶⁹

In dysbiosis, a certain strain of bacteria takes over and forces out other bacteria. We see it happen after some antibiotic therapies, when one part of the microbiome is eliminated, allowing the opportunity for another strain to take over. Figuratively, this is very similar to what happens in cancer, where a single cell wants to dominate at the cost of all the other cells, creating a microenvironment that is hostile to its surroundings. Interestingly, there is also a reduction in biodiversity with global warming: an inflammatory process on the planetary level.

We need to have a symbiotic relationship between us and our gut bacteria because they produce essential components that support healthy metabolism and physiology. This is particularly evident in the relationship between the gut and the brain, often referred to as the “happy gut, happy brain” connection. The same neurotransmitters produced by the brain that affect and regulate our cognitive function and mood, such as serotonin and dopamine, can also be produced by the gut bacteria. As a matter of fact, research estimates that up to 90 percent of serotonin—our feel-good neurotransmitter—is produced by gut bacteria.⁷⁰ This amazing connection, which modern medicine was not aware of until recently, has been well established in Chinese medicine for centuries. In Chinese medicine, there is a correlation between mental digestion of information in the brain and physical digestion of nutrients in the digestive system. This is why Chinese medicine treats the digestive system as part of a holistic approach to cognitive health and brain function.

The Microbiome and Autoimmune Disease

Autoimmune diseases can begin in different parts of the body, such as the skin, muscles, joints, gut, or thyroid. Two common autoimmune diseases affect the digestive tract: Crohn's disease and ulcerative colitis. Crohn's disease affects both the small and large intestine, while ulcerative colitis is exclusive to the large intestine. Both of these conditions have extraintestinal, systemic manifestations as well.

In these conditions, inflammation changes the gut lining and expands the space between its cells. This allows antigens (foreign molecules or compounds) to penetrate through the gut and into the circulation, resulting in an inflammatory immune response. This is part of leaky gut syndrome, when bacteria and toxins "leak" through the intestinal wall.

Symptoms of this digestive condition include bloating, gas, cramps, food sensitivities, and aches and pain. The leakiness can happen when tight junctions in the gut lining don't work correctly and allow substances to enter into the bloodstream. This leaking creates an antigen-driven immune response, systemic inflammation, and disrupts our metabolic functions. The consequences can also lead to obesity, metabolic syndrome, diabetes mellitus, and cardiovascular disease.

In patients with gut problems, we know that improving gut health not only improves their digestion but other health conditions outside the gut as well. We have a growing understanding of the relationship between the health of the gut, the microbiome, and our general health.

SUPPORTING THE MICROBIOME'S HEALTH

Probiotics are one of the most popular dietary supplements available. Yet, often when we take them, we don't see any real change. First, it's difficult to

force change. The microbiome requires time to transform, even when we shift our habits and dietary regimen. Second, many probiotics are ineffective. However, taking probiotics *with* prebiotics can have a more positive impact on the gut.

Prebiotics and probiotics can play an important role in healing and preventing microbiome imbalances and infections. We know that a low intake of fiber, a prebiotic, alters the gut microbiota and is associated with the presence of colon adenomas (benign colon polyps) that can later become cancer. A fiber-enriched diet with soluble fiber induces a beneficial shift in gut microbiota, and it will introduce microbiota that produce anti-inflammatory compounds.

We also know that bacteria like lactobacillus and bifidobacterium increase detoxification activity.⁷¹ They produce anticancer or antimutagenic compounds that interact directly with tumor cells and inhibit their growth.⁷² Interestingly, many of the compounds that have an effect on the healthy function of the microbiome such as MCP, beta-glucan, and arabinogalactan also influence both the prevention and treatment of cancer. There is a relationship between microbiome health and normal cellular function, and a healthy microbiome can serve as a therapeutic or preventative measure for cancer.

BALANCE IS COMMUNITY

Now we understand that the microbiome goes well beyond the gut—it influences just about every system of the body. It affects neurotransmitters, hormones, inflammation, and nutrient absorption. If we look at this philosophically, it's in line with the basic concept of community and survival. There is an amazing link between our gut and the rest of our body,

and if cells truly feel safe and relaxed, they will thrive along with everything else around them.

On many levels, the relationship we have with the microbiome is a representation of all relationships: between a cell and its environment, an individual and a community, humans and the environment, and the earth and the universe. We know that billions of galaxies exist with trillions of stars, and similarly, there are an infinite number of cells and cellular reactions in the body. These intricate and complex relationships are beyond our grasp, but there is an innate, remarkable wisdom in how these systems operate.

When we examine the relationship between a cell and its environment, we see they can either support one another or be destructive to each other. The same applies to the relationship between an individual and their community. And when we look at the relationship between the microbiome and the different components within it, the same idea is reflected. At each of these levels, we can choose a survival response, which leads to fighting and destruction, or we can choose balance, harmony, and mutual respect, which leads to longevity.

⁶⁵ Luke K. Ursell, Jessica L. Metcalf, Laura Wegener Parfrey, and Rob Knight, “Defining the Human Microbiome,” *Nutrition Reviews* 70 (2012), <https://doi.org/10.1111/j.1753-4887.2012.00493.x>.

⁶⁶ Rosa Krajmalnik-Brown, Zehra-Esra Ilhan, Dae-Wook Kang, and John K. Dibaise, “Effects of Gut Microbes on Nutrient Absorption and Energy Regulation,” *Nutrition in Clinical Practice* 27, no. 2 (2012): 201–14, <https://doi.org/10.1177/0884533611436116>.

⁶⁷ Leah T. Stiemsma, and Karin B. Michels, “The Role of the Microbiome in the Developmental Origins of Health and Disease,” *Pediatrics* 141, no. 4 (2018), <https://doi.org/10.1542/peds.2017-2437>.

⁶⁸ A. Lucas and I. St James–Roberts, “Crying, Fussing and Colic Behaviour in Breast- and Bottle-Fed Infants,” *Early Human Development* 53, no. 1 (1998): 9–18, [https://doi.org/10.1016/s0378-3782\(98\)00032-2](https://doi.org/10.1016/s0378-3782(98)00032-2).

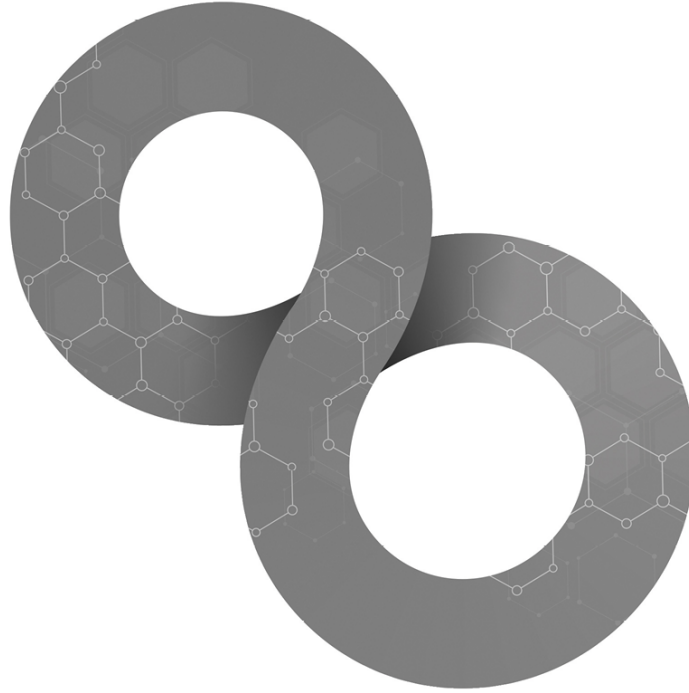
⁶⁹ Weidong Ma, Qixing Mao, Wenjie Xia, Gaochao Dong, Changhua Yu, and Feng Jiang, “Gut Microbiota Shapes the Efficiency of Cancer Therapy,” *Frontiers in Microbiology* 10 (2019), <https://doi.org/10.3389/fmicb.2019.01050>.

²⁰ Jessica M. Yano, Kristie Yu, Gregory P. Donaldson, Gauri G. Shastri, Phoebe Ann, Liang Ma, Cathryn R. Nagler, Rustem F. Ismagilov, Sarkis K. Mazmanian, and Elaine Y. Hsiao, "Indigenous Bacteria from the Gut Microbiota Regulate Host Serotonin Biosynthesis," *Cell* 163, no. 1 (2015): 258, <https://doi.org/10.1016/j.cell.2015.09.017>.

²¹ Belal J. Muhialdin, Nazamid Saari, and Anis Shobirin Meor Hussin, "Review on the Biological Detoxification of Mycotoxins Using Lactic Acid Bacteria to Enhance the Sustainability of Foods Supply," *Molecules* 25, no. 11 (2020): 2655, <https://doi.org/10.3390/molecules25112655>.

²² Hongyun Wei, Linlin Chen, Guanghui Lian, Junwen Yang, Fujun Li, Yiyu Zou, Fanggen Lu, and Yani Yin, "Antitumor Mechanisms of Bifidobacteria (Review)," *Oncology Letters*, 2018, <https://doi.org/10.3892/ol.2018.8692>.

PART THREE



BREAKING FREE FROM THE SURVIVAL PARADOX

CHAPTER FOURTEEN

DETOXIFICATION AND LETTING GO

Detoxification is a term used quite frequently today but without complete clarity about what it really means. People often talk about “detoxing” their colon or liver, but what are they doing exactly?

So many books have been written about detoxification and how to detoxify, and these resources are full of practical advice. In Appendix E, I will also provide detailed practical advice, along with protocols and guidelines for the execution of a healthy detoxification diet or program. But with this chapter, I aim to offer a deeper understanding of what detoxification is specifically in relationship to the survival paradox and how we can best use detoxification for transformation, healing, and growth.

If we examine human physiology, we see that the human body is in a constant state of detoxification. Our breathing cycle is the perfect example of this: we nourish the body by taking in oxygen when we inhale, and we detoxify by letting go of carbon dioxide when we exhale. And what happens during the gap between the two actions? Transformation occurs, a change happens. Throughout our physiology, we see such an ongoing dialogue between action and rest. Action creates movement, and the time of rest allows for real change.

A process similar to the cycle of breathing and detoxification happens in the cell membrane. The cell “inhales” or absorbs nutrients, and then it “exhales” or detoxifies unnecessary compounds through membrane transport into the extracellular matrix. The cell goes through a continuous process of nourishment and detoxification, which impacts itself and its surroundings.

For example, the extracellular matrix takes in nourishment from the capillaries, but it also releases what it *doesn't need* directly into the venous blood that returns to the heart. In addition, these waste products are cleaned by the lymphatic system, which eventually drains unwanted materials into the venous system and back into the heart.

The detoxification process of the body is ongoing; it happens at every level of the entire body simultaneously, including the cellular level. Interestingly, when we are born, the first thing we do is “exhale” fluids out of the lungs so we can breathe, effectively detoxifying. Exhaling is also the last thing we do when we die. Dying is the final stage of “letting go,” showing us that detoxification is fundamental to our existence.

DISCHARGE AND ELIMINATION

To better understand detoxification, let's explore two related concepts: discharge and elimination. *Discharge* is the process of releasing unwanted by-products, such as toxins or metabolites from the cell, tissue, and organ, and expelling them into the circulation. I often liken it to someone opening all the drawers in their kitchen and throwing everything out onto the floor or the counter. This exposes toxins and damaging compounds that have been sequestered and hidden. And this process transcends the physical.

From a psychological perspective, this means that something buried or

hidden in our subconscious can come to our awareness or consciousness. An example would be hidden traumas coming to light. When we bury our traumas, we physiologically deposit such issues in the most inert tissue of the body: fatty tissue. If you've ever followed a detox regimen, you may have experienced a reduction in fat storage, as well as a release of memories and emotions you weren't aware you had been carrying. A similar process takes place when the body sequesters pesticides, heavy metals, and toxins. This is why we often find toxins and heavy metals in fatty tissue. During the detox process, these can be released as well.

The toxins released by a breakdown of fatty tissue during detoxification will enter the circulation. This means they can end up in different places in the body with the potential to cause damage. How do we get rid of these damaging by-products? Through healthy *elimination*, the process of taking exposed toxins and excreting them outside of the body. Elimination takes place through the stools, urine, skin, and breath. If there's an imbalance and we have excessive discharge with insufficient elimination, it will result in symptoms on all levels—physical, emotional and psychological. This is why an authentic and complete “letting go,” which characterizes the full process of discharge and elimination, is so important. Refusing to let go is the hallmark of survival (and the survival urge will drive and activate galectin-3).

THE PHYSIOLOGY OF DETOXIFICATION

As I mentioned earlier, many people engage in “detox” on a regular basis, but what they try to detoxify can vary greatly. Some people focus on detoxing from a physical perspective, and others work to get rid of negative emotions, like jealousy, anger, and fear, or they try to break free of mental fixations and traumas. Determining what you want to detoxify is a crucial

starting point of the detox process. But no matter the goal, detoxification follows a particular cycle.

In Chapter 9, we discussed the liver, which is also our big storage and detoxification organ. It stores more blood than any of the other organs, and it governs endless metabolic processes, making it a factory for discharge. When the liver releases waste into the bloodstream through the hepatic veins, this waste then travels throughout the circulation and can lodge in different organs and tissues.

Discharged toxins affect different organs based on where the toxins travel when they leave the liver and the specific relationships between organs. In Chinese medicine, this flow of detoxification is called the “detox cycle.” If the detoxification process is well designed, and elimination is able to clear whatever is being discharged from the organs, the detoxification process will unfold more smoothly without the side effects that can occur at each stage.

When the detoxification process is not truly balanced, it is possible to experience different symptoms. Understanding the symptoms, the sequence, and the time it takes for the symptoms to move from one stage to another can allow us to evaluate and predict the end of the detoxification process, and to better support the body and the person.

When we engage in a detox program, some symptoms may occur, and the first ones are often related to breathing. This makes sense because in the process of circulation, venous blood travels from the liver, through the right ventricle of the heart, and then from the heart to the lungs. Discharged material then arrives at the lungs, the first stage in the detox cycle. Congestion, cough, and increased mucus production are all by-products of this first stage in the detox cycle.

If the toxins don't get eliminated through breathing, they return to the heart and go back into the body through the arterial circulation. As we've previously discussed, when the arterial blood leaves the heart, it first nourishes the heart itself through the coronary arteries. Therefore, the heart is the second stage in the detox cycle, and this stage can often produce symptoms that relate to the heart, such as palpitations. Given the strong heart-brain connection—the heart secretes its own neurotransmitters and sends more signals to the brain than any other organ—this phase can also trigger symptoms that are mentally or emotionally expressed, such as insomnia, excessive dreams, and new or unique insights.

If the blood and detoxified material continue to travel, they can affect the digestive system and the joints, the third and fourth stages in the detox cycle, and will eventually make their way to the kidneys, the final stage. The kidneys may eliminate the toxins, but if they are unable to do so, the toxins can circulate back and return to the liver. The movement between these stages will flow at different speeds in different individuals.

Often when patients get worse during detoxification, doctors call it a "healing crisis." While this may be true, it can also signify an imbalanced detoxification process. When detoxification is done in a harmonized and balanced way, we can prevent side effects from occurring at each stage. It can be as straightforward as providing additional support for a specific organ in the detox cycle. For example, giving herbs to support the lungs in a person who manifests symptoms of weak lungs or providing additional sleep support for someone who tends toward insomnia. I will often prepare a specific tincture that supports all the organs in the detox cycle. By providing specific herbs that support each organ targeted in the detox cycle within a single tincture, we are able to support each organ individually, while at the same time supporting the entirety of the detox process.

DETOXIFICATION AND THE UNIVERSE

We've discussed the breathing and the exchange of air in the lungs a few times—how this exchange allows us to detoxify and then release toxins into the environment and universe. Fortunately, the universe has the infinite capacity to hold anything and everything. As a container, the universe can handle things that are toxic to us as individuals, and in return, it provides us with oxygenated clean air. Whatever is toxic to us as mere individuals is easily contained by the infinitude of the universe. The universe is kind enough to accept our toxicity, but if our environment becomes too toxic, the outside world will no longer be able to provide us with nourishment in return. This has profound implications on multiple levels beyond this book, but what we need to recognize is that we have an intricate, interdependent relationship with the outside world, with our environment, and with the universe.

Since cells continually produce waste, detoxification must be an ongoing process. And although detoxification is never ending, it's not a real or permanent solution to cellular toxicity—it does not uproot the *cause* of the toxicity. But inherent in the detoxification process is the potential for us to let go, whether on a cellular or psychological level. The process of transformation begins when we recognize and connect to the universe as our infinite reservoir of elimination. This connection is forged by attending to our breath to balance nourishment and elimination. It is in the gap between elimination and nourishment that transformation takes place.

STAGES OF A DETOXIFICATION PROTOCOL

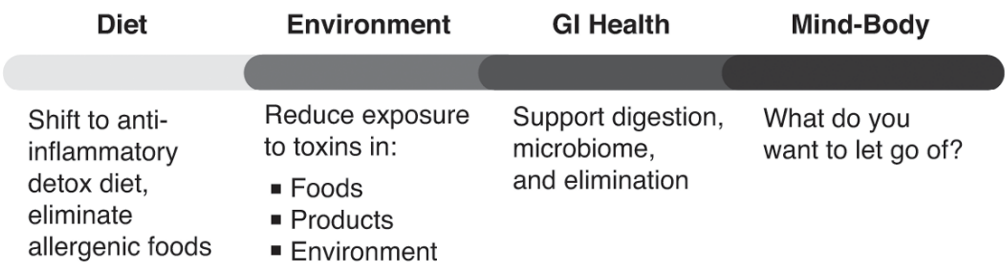
Supporting the detoxification process is a two-pronged approach: we can support the constant detoxification our bodies naturally undergo on a daily

basis through lifestyle and dietary changes. In addition, it is important to periodically engage in an active detoxification protocol, which allows us to shift and improve our health. (Find suggested protocols to achieve both of these goals in Appendix E.)

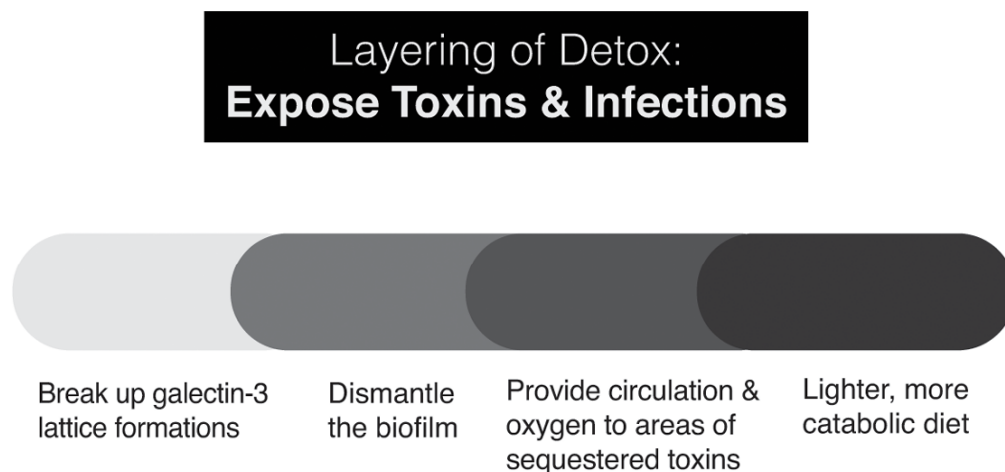
Preparation: Every detoxification program begins with preparation. A good way to do this on the physical level is to shift our diet to a clean, anti-inflammatory one. It's easy to think that starting a detox is a license to go to town and indulge in junk food before it begins, but it really makes more sense to begin clearing the system beforehand.

In addition to eating a better diet, we should reduce our exposure to toxins as much as possible, including those in our environment, in our food, and in different products we might use, such as lotions and shampoos. We can also begin to support our elimination organs: the liver, bladder, lungs, skin, and digestive system. In particular, we need to support our gut, because detoxification can be hard on the microbiome. On an emotional and psychological level, we can prepare by deciding what we want to release in the detox process, be it trauma, memories, emotions, certain reactivity, etc.

Layering of Detox: **Prepare**



Exposing the targets of detoxification: Once we are prepared for detoxification, we have to expose what we want to get rid of. We have to expose toxins, heavy metals, and chronic infections. These often hide from us by using the galectin-3 lattice formation, so exposing and dismantling the biofilm is part of this stage. We expose them through a lighter, more catabolic diet that allows for a breakdown of toxic tissue, by breaking the lattice formation through the use of MCP, by improving circulation to sequestered areas through exercise and infrared sauna, and by uncovering buried emotions and traumas.



Binding: Once we engage in the exposure process, it is essential to bind the toxins that are being exposed. Doing so prevents the toxins from being absorbed by the digestive system, and helps eliminate the toxins from the circulation and the tissue. Using a combination of MCP and alginates is an effective means to bind toxins and heavy metals in both the digestive system and the circulation. Once we have achieved exposure and binding support, we are truly ready to create change.

Discharge and Elimination: Detoxification occurs through discharge and elimination. This is achieved by utilizing phase 1 and 2 of the liver

detoxification pathways.²³ This is where we need the necessary vitamins, minerals, and helper molecules to allow for a healthy and well-regulated detoxification process. We also need to support the body's energy production, mitochondrial function, and the circulatory system, as well.

Phases of Liver Detoxification

The liver plays a key role in the larger detoxification protocol. The liver naturally detoxifies on an ongoing basis, a process that is divided into two phases. Supporting this two-phase process is key to the success of your larger detox regimen.

Each phase requires specific nutrients in order for the process to occur smoothly and effectively. There are also differences in how any two people physiologically handle detoxification. This is related to genetic or epigenetic mutations that can affect the workings of the liver and its capacity to handle change. We can overcome these limitations by supporting Phase 1 and 2 detoxification through the different nutrients recommended below.

Phase 1 Liver Detoxification: In this initial phase, toxins are made water-soluble so they can be eliminated. Phase 1 is essential for the elimination of many foreign substances, including alcohol, caffeine, pesticides, environmental toxins, and pharmaceuticals.

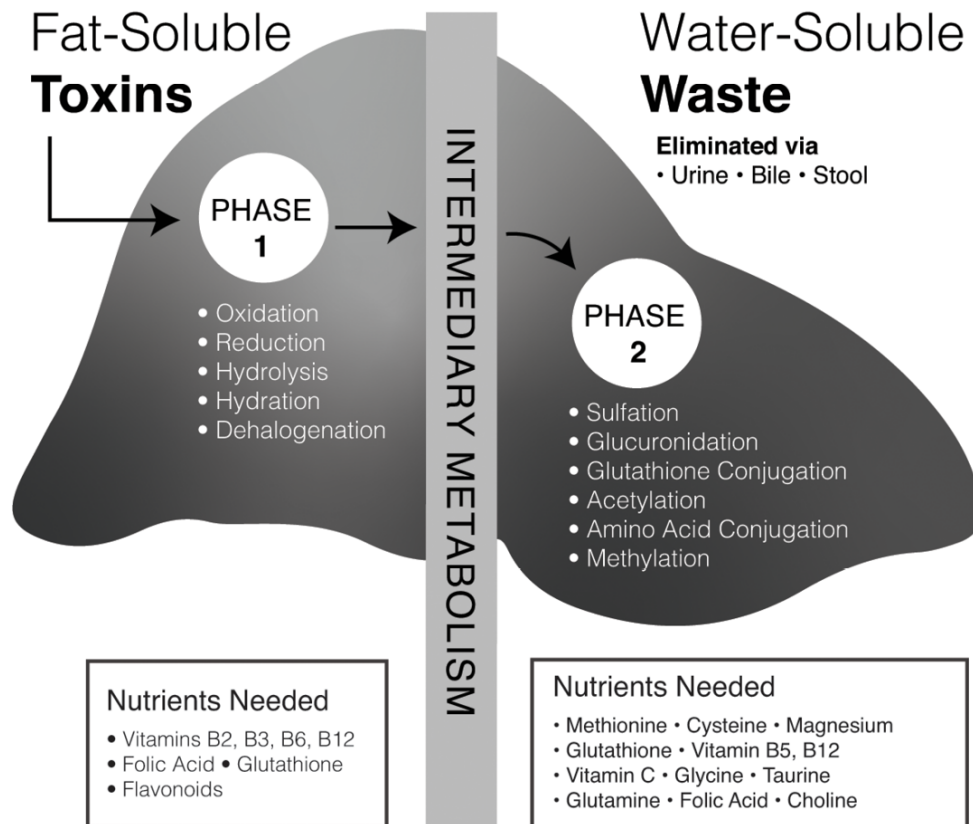
Phase 1 requires different nutrients, such as B-vitamins, folic acid, glutathione, antioxidants (like milk thistle and turmeric), carotenoids, vitamins E and C, and minerals (such as selenium, copper, zinc, magnesium, and iron).

Phase 2 Liver Detoxification: Neutralizes the water-soluble toxins produced in phase 1 through the process of conjugation. Phase 2 eliminates free radicals. Therefore, insufficient Phase 2 detoxification can contribute to

the development of different diseases, such as cancer, Parkinson's, fibromyalgia, chronic fatigue, lupus, and immune dysfunction.

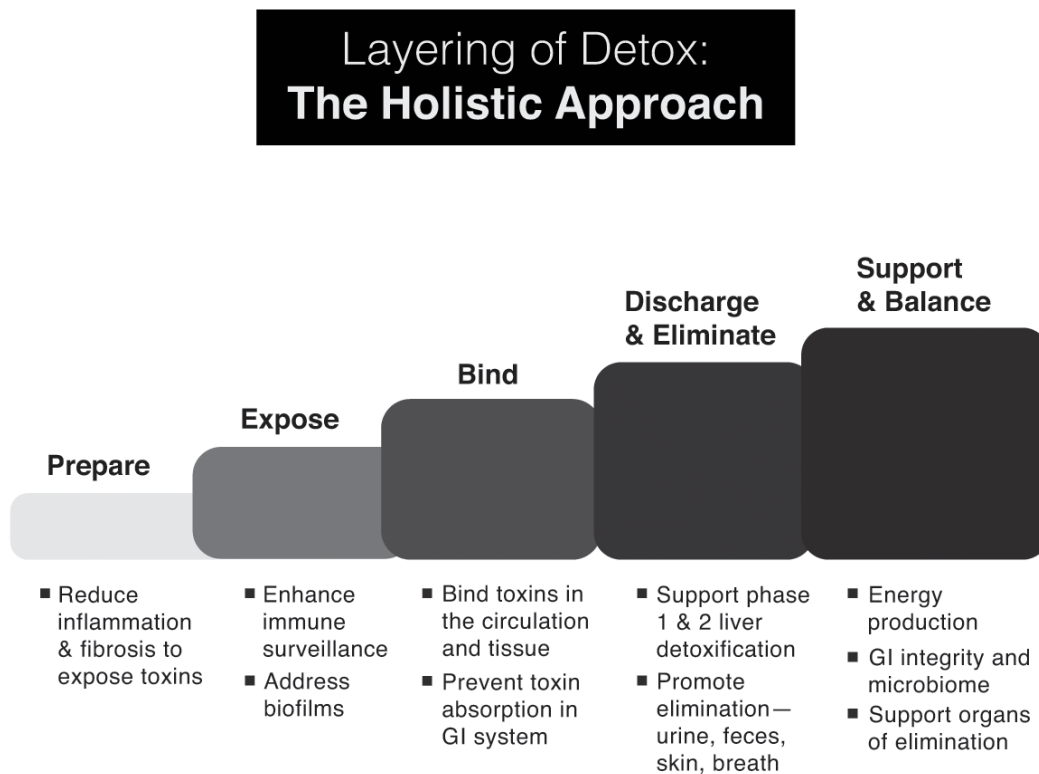
Phase 2 requires different nutrients, such as amino acids (glutamine, glycine, taurine, cysteine, methionine), sulfated phytochemicals (like those found in garlic, cruciferous vegetables, meat, egg yolks), trace mineral molybdenum (found in leafy greens) and vitamin B12 (found in fish and meat). Other nutrients that help Phase 2 detoxification are flavonoids (contained in fruits, vegetables, and many herbs) and ellagic acid (found in red grape skin, different berries, and walnuts, among other foods). You will want to ensure your diet is rich in these nutrients.

Phase 1 & 2 Liver Detox Pathways



Support and Balance: We need to support and balance the detoxification process throughout all its phases. This can be done through supporting the body's energy production and mitochondrial function. Our cells require enough energy to activate different detoxification pathways that are enhanced during the active detox program. Supporting the circulatory system allows nutrients to be delivered to the target tissues being detoxified and supports the drainage of toxins and waste products from these tissues. Often, an intense detoxification process produces excessive free radicals, putting additional pressure on our antioxidant system. Supporting the

antioxidant pathways and providing abundant antioxidants, minerals, and nutrients supports the organs of elimination and is essential to successful detoxification.



THE ROLE OF THE GUT

The gut and its microbiome play a key role in detoxification. While the small intestine is responsible for nutrient absorption, our large intestine is a pivotal elimination organ. Supporting the integrity of the gut sustains the balance between nourishment and detoxification. This is essential for a successful detoxification program and for our overall well-being. The integrity of our gut is challenged by various toxins and pesticides, especially glyphosate (Roundup). If you have significant glyphosate exposure, your detoxification program may need to be adjusted to provide additional support to the gut.

We can support our microbiome by eating the right foods, and by utilizing prebiotics and probiotics. As I've said, I recommend a combination of prebiotics and probiotics (with a preference for "live preparations" in liquid form rather than capsules and tablets), because prebiotics provide nourishment for healthy bacteria, help prevent the build-up of biofilm, support healthy digestive function, and prevent aggressive bacteria from growing.

FINAL THOUGHTS ON DETOXIFICATION AND GALECTIN-3

In order to heal, we need to go through the process of detoxification because there has to be an exchange between detoxification and nourishment. This exchange results in transformation—healing. Transformation happens on all levels: at the cellular membrane level, extracellular matrix level, tissue level, the level of the organs, and the person as a whole.

If we're isolated, we can't experience healthy exchange and transformation, and we can't get rid of toxins or take in oxygen from the environment. This is true all the way to the cellular level. This is why the isolation created by galectin-3 cannot and will not sustain life. It may give the short-term illusion of protection, but in reality, all it does is build a wall while flames heat up on the other side. Bacteria may be growing, or cancer cells may be developing, and because of the isolation created by galectin-3, our body won't be able to communicate with them and address the issue.

An isolated area is essentially boxed in and is no longer being controlled by the body. This is known as a "box pattern" in Chinese medicine. The boxed part of the body has its own metabolic system and needs, and it can

consume our energy, since we have no control or communication with this area. It can hide heavy metals and toxins, allow bacterial infections to grow, or encourage fibrotic and autoimmune diseases and cancer. We can now see why targeting galectin-3 is at the heart of healthy detoxification and how detoxification is at the heart of healthy life.

²³ Romilly E. Hodges and Deanna M. Minich, “Modulation of Metabolic Detoxification Pathways Using Foods and Food-Derived Components: A Scientific Review with Clinical Application,” *Journal of Nutrition and Metabolism* 2015 (2015): 1–23, <https://doi.org/10.1155/2015/760689>.

CHAPTER FIFTEEN

ADDRESSING THE SCARS OF SURVIVAL

Going through life, we all accumulate wounds. These wounds may be either emotional, physical, or a combination of both. When the insult is great and the wound doesn't resolve itself, it heals with a scar. A scar is not functional. A scar is not alive. Therefore, healing the scars of survival allows us to be more alive.

The automatic, survival-driven responses we've been discussing also result from such traumas. But since we carry our traumas over multiple generations, the survival-driven response in the present is often not related or proportional to the present situation. We all experience this many times throughout our lives. As such, these traumas limit our ability to be truly present and experience life—when we heal, we are better able to be in the moment.

Every cell in our body has up to one million reactions per second! And If we look at the quantum level, everything is always in flux—nothing is static. Everything is possible because everything is changeable. Quantum physicists have found that the mere act of observing something affects what is being observed, known as the “observer effect.” To use the words of Max Planck, father of quantum physics, “When you change the way you look at things, the things you look at change.”

We are not bound by whatever genetic material we have but rather can change and create ourselves all the way down to the biochemical level.

THE ROLE OF EPIGENETICS

We often ask ourselves why we react or behave in certain ways. I definitely do. Where does a particular trait come from? Why do we have the diseases we have? Who we are is a by-product of an endless number of people over multiple generations who contributed to our making. They are all imprinted within us. Some provided us with their unique qualities and strengths, and others provided us with an imprint of their traumas and survival responses. These have been scarred into our DNA and our DNA expression.

For some of us, certain patterns have been reinforced over generations, both positively and negatively. Amazingly, these imprints, these inherited negative trends that can express themselves, can also be turned off. What a revelation! We actually have a *choice* in the expression. Healing these scars can have a profound effect on our health and the health of those around us.

Epigenetics is the study of changes in our gene expression caused by factors other than our DNA. Environmental factors and other influences interact with our genetic inheritance and modify how these genes are expressed.⁷⁴ For example, stress and lifestyle choices can shift the way we feel and behave—these can change our state of well-being.⁷⁵ These influences don't actually change the DNA sequence itself, but rather change or affect the *activity* of the gene, effectively turning the gene on or off. This is accomplished through different chemical reactions, which are influenced by our lifestyle. Epigenetics refers to changes in gene expression that are

modulated by factors other than our DNA.

The study of epigenetics is intriguing and has transformed our thinking and understanding of what is possible in the realm of healing. When examining epigenetics from a broader, philosophical perspective, we need to take into account that an infinite number of people contribute to our gene expression. True, the genes we are born with don't change easily (in fact, they rarely change). But the fact that we have the option to turn them on and off, means that even though we may have the genes to express a particular disease, we can either halt or enhance gene expression through other factors—which can then determine whether or not we will actually get the disease.

Therefore, epigenetics may play a greater and more immediate role than our genetics do when it comes to our health and well-being. In particular, epigenetics can be the cause of some of our scars of survival and simultaneously a pathway to healing our scars of survival.

BOXES AND LOOP PATTERNS

During our lives, we deal with all manner of difficulties, whether expected or unexpected. We're also exposed to toxins and traumas. As part of our survival drive, the body has developed mechanisms to neutralize these damaging influences.

One of the ways the body does this is by packing issues up and moving them aside so they don't interfere with our daily function. These issues can be physical, emotional, psychological, or a result of trauma or exposure to toxins. They get packed up and stored in certain parts of the body. I often refer to these areas of storage as “boxes.” These boxes are complicated because we don't just hold our own issues from the past within them. We

can also hold on to current difficulties or inherited genetic and epigenetic patterns.

In Chinese medicine, we can actually feel these boxes when we take a pulse. The body stores these boxes in different parts of the body, based on which tissue is most suitable for long-term storage and which organ system the issue relates to.

I'll use my own family to give an example of an inherited epigenetic pattern and a "boxed" survival reaction. My grandparents both survived the Holocaust, but they responded to it very differently. My grandmother was strong, and my family was saved by her strength and instincts. She insisted they board a ship from Romania to Turkey one night in 1944, even after she was told they'd have to leave all of their belongings behind. If she could wait until the next morning, they could take their belongings with them, but she decided to take the first ship. The night ship my family boarded made it to Turkey, but the morning ship was attacked by the Nazis, and everyone on board drowned. She continued to be strong and utilized her survival instinct throughout her life—she overcame two forms of cancer and lived to be ninety-eight years old.

My grandmother was always on the alert. But this came with a price: smiling and being happy were never her forte. Epigenetically, she passed her remarkable strength on to her only daughter, my mother, who came to Israel as a refugee at the age of eight. My mother was able to create a supportive family of five children while maintaining a stellar career as an appellate court judge.

My grandfather, on the other hand, had a different reaction to the horrific experiences of the Holocaust. Five of his eight siblings as well as his parents were killed, and he couldn't stomach what had happened to them.

He literally couldn't digest it, and he never talked about it. It was boxed deep inside his stomach. He developed stomach cancer and died at the age of fifty. His name was Isaac, and I am named after him. And while I never met him, I not only carried his name but his unresolved pain, something I was not aware of.

What happened with my family is an example of how we can manifest experiences in our bodies and how that manifestation can be multi-generational. The habits we inherit or develop have a profound impact on our lives and the lives of our family members. Sometimes a thought or tendency can be so strong it becomes a dominant trait within a family. These repetitive cycles are called "loop patterns" in Chinese medicine. These patterns can permeate through every level of a person all the way down to the cellular level.

However, epigenetics is a dynamic process and gives us the ability to change these patterns and ourselves. It allows us to create an inner change, but it can only happen when we recognize that we have the *capacity* to change.



MULTIGENERATIONAL HEALING: MY STORY

Let me share with you my own epigenetic healing story. All my life, I experienced tenderness and pressure in my sternal area. I had a deep sense that this pain and pressure represented something significant that I had been carrying my entire life. After decades of training and practice in meditation, combined with insights I had gained on how to use meditation

for multigenerational healing, I was finally able to touch the source of this pain. It was unresolved pain and trauma from my family's experience in the Holocaust passed on to me.

How was I able to locate and understand this pain? It is a deep and complex topic that warrants its own book (which I am currently writing). The process is a result of the integration of meditation and healing practices I have developed over decades. And although it is complicated, some of the guiding principles are presented in this book. The key one is connecting with our heart and learning to transform the survival response into compassion and harmony. We each have hidden sources of pain that we carry, and sometimes simply being motivated to unlock them can trigger a change.

Once I acknowledged and released my inherited trauma, the memory and somatic response simply vanished. It's still hard for me to comprehend the sense of openness I now experience in my chest, accompanied with a deeper sense of emotional freedom and spiritual well-being. This healing process involved a deep acceptance and forgiveness taking place within me. And as part of the multigenerational, epigenetic transformation, my mother, who was not aware of my healing process, was suddenly able to watch television programs about the Holocaust for the first time ever. This is the power of multigenerational healing and of creating a shift in the survival response.

MUCH CAN BE STORED IN BOXES

My training in Chinese medicine influences the way I look at blood tests. I don't look at them in a traditional manner, and they hold various different meanings for me. There are times when the results of a blood test appear to be normal, but when I look at other factors within the patient, I might uncover a hidden disease.

For example, if a person has cancer, there are certain expectations of what you should see in their blood, such as elevated inflammatory and fibrotic markers and hyperviscosity. However, if these markers come back in a range that is normal, or even below normal, the standard interpretation is that things are looking good. But for me, it may be an indication that the cause and driving force of the cancer is boxed off, hiding somewhere out of reach. Either the patient is unable to mount an appropriate survival response, or they are hiding the issue. And when I treat these patients, these markers will often increase into the normal or expected range for the disease, and the patient will become aware of what was boxed. This signifies that what was hidden has been revealed—when we find and open the boxes, we uncover the real story.

CHANGING THE PREDICTABLE

Our bodies are extremely complex, and much of the complexity comes from our multigenerational issues.

While we may be susceptible to certain hereditary illnesses or conditions, we can avoid many of them by making healthy lifestyle changes. There is a Hebrew saying that describes this: “Everything is predicted, but we have a choice.” Certain outcomes may be quite predictable if we continue along the same path as our ancestors, but if we travel in a different direction, we can change it. Changing the outcome requires making a change in our habits; we must shift from the expected to the unexpected.

To give a simple example, if you stay on one highway to drive from one city to another, you expect to arrive at your destination at a certain time. However, if you took a completely different road, you could end up in an unexpected place. These journeys happen in our lives all the time. Shifting away from the expected can move us away from the reactivity that drives the survival response. Blocking the damaging influences of galectin-3 is a critical element in creating this shift.



RACHEL'S STORY

Rachel was a dedicated meditator and lived an exemplary life of health. Despite her healthy lifestyle and commitment to meditation and mind-body practices, she developed aggressive cancer in her thirties that manifested in the center of her chest (an area symbolizing the heart in Chinese medicine) and spread to her neck.

Due to the seriousness and aggressiveness of the cancer and her young age, she received an experimental chemotherapy protocol that was multiple times stronger than the standard chemotherapy regimen. I supported her through the chemotherapy process and its debilitating and life-threatening side effects that nearly killed her. When it was finished, the treatment was deemed a success. Her cancer was gone.

I continued to treat Rachel, and about a year after she completed her chemotherapy treatments, I saw her at a meditation retreat center. She had just returned from her follow-up CT scan and visit with her oncologist. She hugged me, and shared the news with great joy: “My scans are clear!” But for some reason, the words I heard were, “My cancer is back.” It was odd, but I dismissed it.

The next day, Rachel woke up with a huge mass on the right side of her neck. The cancer was back, full blown. And this time around, with her type of cancer and the chemotherapy she had already received, the probability of responding to another round of chemotherapy was extremely low.

I instructed Rachel to leave the retreat center as soon as possible to see

her oncologist for an urgent evaluation. Rachel got into her car and drove away from the retreat on the same dirt road she had traveled many times when going home. It was a desolate road, and she usually coasted through a lonely intersection and turned left onto the highway on the way out. This time, however, she stopped.

The usual left turn would take her to the regular road home, back to her regular life, a life dedicated to the discipline of spiritual practice and meditation. But if she turned right, it would take her to the town where she attended college years ago. The place where her jubilant girlfriends, creativity, music, dancing, and carefree life once was—a marked contrast to where she was at that junction, sitting in her car.

Rachel sat in her car at the intersection, the sun slipping beneath the mountains behind her. Instead of turning left as she had done so many times before, she turned right, and she didn't look back. She camped for a number of days in nature in an area close to her college town before heading home.

Rachel made a radical change in her life, the kind of change that permeates all the way to the cellular level. All of us expected her to return to the retreat center shortly thereafter, but she never did. She separated from her partner, left her home, and changed practically every aspect of her life. She exchanged discipline and rigidity for creativity, flow, and movement.

Rachel connected with her heart and followed its lead, transforming her life. I supported her process with acupuncture and herbs, and during those first weeks of her new life, her cancer disappeared, never to return. By opening her heart and changing her life, she dissolved the habits that nourished and sustained her cancer, allowing it to simply dissipate. It all

began when she turned right instead of left, when she took a different route and created a new path. She is still healthy today, twenty-five years later.

THE IMPACT OF EMOTIONS AND ISOLATION

In addition to making healthier choices, recognizing negative emotions and changing how we react to them can have a positive impact on epigenetic tendencies and our levels of galectin-3. When we are stressed out, angry, or sad, we may isolate ourselves and go into survival mode. And what happens then? We activate the sympathetic nervous system and galectin-3.

This isolation strategy of survival disrupts the communication that is vital to life, and it paves the way for chronic diseases.⁷⁶ We can't be healthy in isolation, and research shows that people who live in communities are better able to thrive. People who are in a spiritual community, have social exposure, or live with a partner are also more apt to live longer. Charles Darwin himself wrote, "Those communities which include the greatest number of the most sympathetic members, would flourish best, and rear the greatest number of offspring."⁷⁷ When we build communities that are rich in compassion and empathy, we override our self-oriented survival instinct, increasing our own personal survival and that of those around us.

Further, emotional traumas can greatly affect our health. In these cases, we need to consider factors that go beyond lifestyle and epigenetics, because any stimulus that triggers the memory of the traumatic event causes an automatic, uncontrolled response. For instance, when the trauma is triggered, we may start sweating, have palpitations, or start shaking. We don't think about how or why we respond in this way—it's an automatic, post-traumatic response. This response occurs because the neurons that

hold the emotional memory of the trauma go through a particular sequence, and the memory is recreated and “relived” through the brain. The neurons have created a pathway for this automatic response.

We know that traumatic experiences and events can cause severe emotional and physical damage. The suffering, pain, and high levels of cortisol can increase blood pressure, cause heart problems, induce kidney damage, and shorten lives. All of these reactions are driven by the survival response, and this very response that keeps people alive is the same one that causes ongoing pain, suffering, and disease. This is yet another aspect of the paradox of survival.

HELP FOR PTSD

By addressing post-traumatic stress disorder (PTSD) through specific meditation and visualization techniques, I've been able to help people with PTSD improve dramatically. In my meditation and healing retreats, we integrate ancient knowledge of meditation, understanding of physiology and cellular biology, and transformation of the memory experience on all of these levels. Through this process, a person recognizes that the survival response or mechanism that was necessary at the time of the trauma is no longer needed, allowing the pattern to simply vanish.

TREATING OUR PHYSICAL SCARS

Much like emotional scars, physical scars, especially when they are large, can impact our health and well-being. Scar tissue can feel tight, inflamed, and sometimes painful for a very long period of time. I've had patients tell me that twenty-year-old scars still itch or feel tender because they've never fully healed; they're always in the process of repair.

Such a scar is caught in a “repair cycle,” and can cause continuous, long-

term elevation in galectin-3 and other inflammatory compounds. Just like emotional traumas, physical scars can affect our health all the way to the cellular level. The body holds on to the trauma of the scar, producing different symptoms and ailments based on the location, size, and direction (vertical, horizontal, etc.) of the scar. So, what would happen if we could interrupt this vicious loop, this destructive cycle?

I do this in the clinic by injecting the physical scar with a short-term anesthetic, procaine, combined with homeopathic mixtures that help mitigate the release of the trauma and the memory. This is done as part of an acupuncture and healing session in which the patient is supported in their process of letting go and in the nourishment of a new, healthier energy flow pattern.

I've treated and injected the scars of hundreds of patients, and while you aren't supposed to use the terms "100 percent" or "always" in medicine, practically every patient has had some degree of improvement in the size, thickness, and sensation of their scar. For some, it's a mild reduction of thickness and size, by roughly 15 to 20 percent. For others, it may reduce by 50 to 70 percent. The most amazing part is that the reduction happens almost immediately, and the scar never returns to what it was. How is this possible?

Just like with an emotional or mental scar, when we anesthetize a physical scar, we interrupt the ongoing loop between the scar and the brain.⁷⁸ The registered memory of the trauma associated with the scar is erased. The neuronal response is no longer needed, and it is simply released. And when the anesthetics wear off 45 minutes later, the body doesn't return to its old pattern. The nervous system response is realigned, and as a result, the scar and its tissue have relaxed and forgotten the

trauma, allowing for change on both the physical and emotional level. In my specific approach, I offer additional treatments and healing that take place before, during, and after the scar injection. These treatments facilitate and enhance the deep healing that is made possible due to the release process of the scar injection.

GALECTIN-3 AND LONGEVITY

Physical scars, negative emotions, psychological states, and how we respond to stress all have an influence on our levels of galectin-3 and can affect our longevity. We know that high levels of galectin-3 impact our mortality and shorten our lives, so if we can bring it down and create harmony in our bodies, that means that we can be healthier and live longer. Moving away from a state of chronic stress and survival and into one of well-being, spaciousness, and harmony makes this possible.

A fascinating study examined the levels of galectin-3 in centenarians and compared them to the levels of people in their seventies and eighties. The study discovered that centenarians had much lower levels of galectin-3 than those in their seventies and eighties!⁷⁹ Somehow, people who live to a significantly older age have less galectin-3 in their bodies, and they maintain their systems without reverting to inflammatory and fibrotic processes. They either decrease the wear and tear process itself, or they are able to repair it in a more efficient way.

Another study examined the levels of galectin-3 in thousands of people who were about fifty years old. The researchers checked the participants' baseline galectin-3, and followed up on their health for the next ten years. There was a remarkable difference between the group whose galectin-3 levels measured in the upper 20 percent and those in the lower 40 percent.

The difference in all-cause mortality between the groups was striking: those with the highest levels of galectin-3 had a threefold mortality rate compared to the lower group. This led researchers to conclude that galectin-3 is a predictor of all-cause mortality.⁸⁰

TOWARD QUALITATIVE LONGEVITY

The standard definition of longevity is quantitative—we measure it based on how long we live. However, another perspective of longevity that originates from Chinese medicine is qualitative; it considers longevity to be the measure of our life experiences and how many things we've done in our life. For example, Mozart died at the age of thirty-two, but his quantitatively short life was one of great qualitative longevity. He accomplished so many things and impacted so many people that he is still “alive” today.

I don't believe there can be a single perspective of longevity. Someone who lives to the age of one hundred may feel like they never truly lived or that they had a short life. Others who lived a short life may feel like they lived forever. Moving slower from point A to point B naturally takes longer, and that can increase the subjective experience of time while reducing the wear and tear of life. So slowing down, creating space, and producing energy in an efficient manner without being in a rush or creating a crisis effectively lengthens a person's life!

Longevity is not just about how long we live; it's also about giving life meaning. When we look at longevity from a qualitative point of view, it's easy to create change—we aren't stuck or lacking movement. Life can become a constant flow of movement, change, and transformation. When you focus on quality of life, your quantity may also expand because you will

be less stressed, have less friction, and not sink into survival mode as often.

⁷⁴ Linda O'Neill, Tina Fraser, Andrew Kitchenham, and Verna McDonald, "Hidden Burdens: A Review of Intergenerational, Historical and Complex Trauma, Implications for Indigenous Families," *Journal of Child & Adolescent Trauma* 11, no. 2 (2016): 173–86, <https://doi.org/10.1007/s40653-016-0117-9>.

⁷⁵ Jorge Alejandro Alegría-Torres, Andrea Baccarelli, and Valentina Bollati, "Epigenetics and Lifestyle," *Epigenomics* 3, no. 3 (2011): 267–77, <https://doi.org/10.2217/epi.11.22>.

⁷⁶ Debra Umberson and Jennifer Karas Montez, "Social Relationships and Health: A Flashpoint for Health Policy," supplement, *Journal of Health and Social Behavior* 51, no. 1 (2010), <https://doi.org/10.1177/0022146510383501>.

⁷⁷ Charles Darwin and Leonard Keble, *The Descent of Man: And Selection in Relation to Sex* (London: J. Murray, 1871), PDF, <https://www.loc.gov/item/04033382/>.

⁷⁸ Heidemarie Haller, Felix J. Saha, Barbara Ebner, Anna Kowoll, Dennis Anheyer, Gustav Dobos, Bettina Berger, and Kyung-Eun Choi, "Emotional Release and Physical Symptom Improvement: A Qualitative Analysis of Self-Reported Outcomes and Mechanisms in Patients Treated with Neural Therapy," *BMC Complementary and Alternative Medicine* 18, no. 1 (2018), <https://doi.org/10.1186/s12906-018-2369-4>.

⁷⁹ Fabian Sanchis-Gomar, Alejandro Santos-Lozano, Helios Pareja-Galeano, Nuria Garatachea, Rafael Alis, Carmen Fiuza-Luces, María Morán, Enzo Emanuele, and Alejandro Lucia, "Galectin-3, Osteopontin and Successful Aging," *Clinical Chemistry and Laboratory Medicine (CCLM)* 54, no. 5 (2016), <https://doi.org/10.1515/cclm-2015-0821>.

⁸⁰ De Boer et al., "The Fibrosis Marker Galectin-3."

CHAPTER SIXTEEN

TRANSCENDING THE SURVIVAL PARADOX

The survival drive is an inherent part of every living being, and we've discussed its purpose, importance, and mechanism of action extensively throughout the book. We now understand that while this drive is necessary for us to simply survive, its paradoxical effects can compromise not only our health and longevity but also our quality of life and the quality of life for those around us. We've all experienced survival mode multiple times in our lives, manifesting as high stress and reactivity driven by the sympathetic nervous system. It's not a pleasant place to be, and the consequences of being stuck in such a state are enormously damaging.

But what if we could transcend this state? What if we could free ourselves from this bound state of survival and shift to a state of harmony driven by an open heart, expressing itself as innate love and compassion toward all living beings, including ourselves? And what if all of this could happen without losing the ability to utilize our survival mechanisms when truly needed?

We began our journey into the survival paradox by introducing an important revelation and understanding: inflammation is a response to survival. Now that we know this, let's take a deeper look and ask ourselves

what drives the survival response. Why is the need to survive so innately imprinted in each of our cells, in our being, in our communities, and in our countries?

I spent most of my life meditating and contemplating such issues. I started this journey as a teenager in Korea and later on learned from and trained under some of the most legendary Tibetan Buddhist masters in the United States and Asia, including in remote regions of the Himalayas. I've been training over the last several decades. I spent ten years meditating daily for half a day; and for twenty years, I went away once per year for extended periods (six to twelve weeks at a time) to meditate in the mountains. And while I'm definitely a slow learner when it comes to meditation, I've gained some insights and understandings that are now expressed in my healing work and teaching.

While I was fortunate to learn some of the most esoteric meditation practices, the deep insight into *what drives survival* was in front of my eyes the whole time. It's always in front of us. We simply aren't trained to notice it, recognize it, and make the necessary shift to free ourselves from it. We grasp on to what we experience outwardly through our senses and inwardly through our thoughts, feelings, and body sensations as if they are permanently true. This grasping is the root of our survival instinct, our struggles, and the cause of our inner pain and suffering.

Let's look at this in greater depth. What do I mean when I say that we perceive our reality as permanently true? Why is this fundamentally flawed? If you examine your life experiences, you can't help but see that *everything changes all the time*. Nothing is permanent!

Take our bodies, for example. Consider how much your body has changed from the time you were a child up to this very moment, while you

sit and read this book. Or think about the home you live in or the furniture you own. One hundred or five hundred years from now, certainly they will age and change. And in one thousand years, they will probably no longer exist. The very atoms and molecules that compose your body, home, and furniture are constantly in flux. And of course, we can look at our own thoughts and internal experience: A thought arises, expresses itself, and vanishes. We don't know what our next thought will be, or what the next moment will bring. *Everything is ever-changing and impermanent*. Modern quantum physics knows it, science knows it, and our bodies know it.

We tend to forget this truth. So much time and energy is spent worrying about things we hold to as fixed, even while they are actually changing by nature. Yet if everything changes at every moment, there is the potential for anything to arise. This is where miracles can happen!

This potentiality is unbounded and inherent within each of us. From a spiritual perspective, we could perhaps think of this as being the “divine within us.” From a Buddhist perspective, not recognizing the impermanent, changing nature of everything causes us to suffer since we lose our openness and equilibrium by holding on to things so tightly. Yet if we step back and see the ever-changing scheme of things, we can begin to relax, and in turn, the grip of our experience begins to loosen. As a result, change can happen, and the doorway to our unbounded potentiality can begin to open. This unbounded essence is naturally expressed in each of us as innate, unconditional love and compassion. We don't have to invent or create it—it's present within us, and it's who we are. What we need to do is become aware of it and integrate it into our lives.

Wow! What a journey!

This is an ongoing journey that continually unfolds, and it holds within it

the potential for infinite healing and transformation—there's the potential for a miracle to happen in each second. The organ that holds this potential in our body is the heart.

RELEASING OUR FIXATION

With this understanding and insight in mind, we can revisit our survival response, our body, and our physiology. Grasping to the ever-changing as if it's permanent triggers the survival response: this is why the response is innate within us. In this very act of holding on to our outer and inner experiences—of trying to prolong them, to make them survive—we inhibit the constant natural change that is needed for health and longevity. The fixation to that which is ever-changing as if it's permanent drives a myriad of emotions, reactions, and responses on the physical, emotional, mental, and psychospiritual levels.

Grasping and fixation have a naturally contracting effect. When we finally see and recognize that we've grasped things that could not be grasped, something softens and opens within us. Our struggle and our fight falls away. It is in this place that we begin to open our heart to ourselves and to others, and the healing power of love and compassion enters. When that happens, we can live longer because we truly heal ourselves, and as a result, we heal our illnesses. When our motivation to live comes from an open heart, we receive unlimited energy and unlimited strength because we connect to a much greater truth.

What, then, is the root of survival? Why do we fixate? It happens because we've lost the ability to see things as they are, and when it's time for what we experience to change, we can't let go. But when we truly let go, we realize that fixation was the very thing that caused us to be sick and suffer

physically and emotionally.

When we have the ability to “let go” of the survival response, we live a longer and healthier life. Our stress hormones, cortisol, insulin, IL-6, and IL B1 decrease. We reduce inflammatory responses and enable appropriate immune responses and the ability to better heal from illnesses.

To give an example, I’ve spent time with revered Buddhist masters who’d sleep only one hour per night and wake up completely refreshed, while none of their attendants could keep up. These masters had tapped into an unlimited source of energy that comes from the ongoing recognition of the impermanent nature of everything. Of course, I am not suggesting you sleep less. Rather, this demonstrates that when we stop utilizing our energy to hold on to things, a far greater reservoir of energy is at our disposal.

Breaking Through to Cancer

Patients who are truly willing to let go can create miracles, but this is trickier with cancer. Even if the healing process is profound, the cancer creates its own microenvironment that is independent from the body. Sometimes the patient’s changes can’t reach the cancer, especially if there’s no longer a dialogue between the cancer and the body. However, through disruption of the galectin-3 lattice formation, we can break into that isolated microenvironment. It is here that combining mind-body methods—combining meditation with a galectin-3 blocker like MCP—can yield amazing results.

Unfortunately, when it comes to healing, the impulse to fixate is not exclusive to the patient. Doctors and healthcare practitioners can have a similar mindset. Using the treatment of cancer as an example, when an oncologist diagnoses a patient and discovers the stage of their cancer, they

immediately “catalogue” their situation. They grasp and fixate on the appearance of the situation, which leads to an anticipated outcome; the doctor doesn’t create space for the unexpected to unfold. However, when a patient surrenders to the healing process without expectations, and there’s no pressure from their doctor or oncologist, amazing things can happen. This is a great lesson for all of us.

Oncologists often send patients to me after they’ve tried all conventional treatments and the patient has been classified as incurable or terminal. If a patient is sent to me with a life expectancy of two months, the doctor doesn’t have any expectations, meaning there is less pressure on the patient to follow a certain protocol in certain ways. The patient is offered more freedom of choice. And while this freedom is allowed because the doctor “gave up,” true, holistic care can utilize this opportunity to create the unexpected. At this juncture, I work with the patient on an individualized protocol while creating space for change and healing. I offer them my care, energy, and heart.

For most patients, this approach makes a difference, with some living weeks or months longer than expected, and others living many years longer. And even if these patients eventually die, our journey together allows them to live longer with a better quality of life and to heal on a deeper emotional and spiritual level.

MELTING FIXATION THROUGH MEDITATION

Before diving deeper into this process, I want to emphasize that there is a difference between letting go and giving up. Letting go of the survival drive is a process of freedom and expansion, while giving up is a process of contraction and despair.

When we are in survival mode, we are self-focused. We think the whole world revolves around us. This “contracts” our life experience. The process of letting go is as simple as it sounds. You simply let go. Let’s experience it right now.

Sit in a chair. Close your eyes if you wish, and take a few deep breaths. Place your hands with your palms face up on your knees. Then take a few more deep breaths. Connect with how your body feels. See if you can feel areas of tension and contraction. Then inhale deeply, hold your breath, and forcefully contract your fists while also contracting your face, lips, and eyes. Feel the tension building up in your body and recognize what a contracted body feels like. Next, exhale the breath, and as you exhale, let your palms completely open, relax your face, and let your whole being relax. You can make a “ha” sound when you exhale as part of the process of letting go. Do this a few times, and then simply sit and get in touch with your body. You can experience how different you feel. We spend most of our time living in a state of contraction, though unaware that we are doing so.

The process of letting go is endless. We can always be more open, more spacious, and less contracted. The secret of letting go is to let go of the experience itself—don’t hold on to it, and don’t have any expectations. Any holding, any identification creates grasping. It’s remarkable to watch how people can change over the course of a few days when they actively engage in this process in a retreat setting—when the environment, schedule, diet, and activity promote the letting go process on all levels. Through movement of the body, through breath work, and through working with the mind, fixations melt away.

I’ve seen patients’ cancer markers decrease after just a few days of meditation at healing retreats. For these patients, relaxing and opening up

their circulation changed the cancer's microenvironment, exposing it to their immune system. The fear-based grasping of survival was transformed into an open-hearted motivation to live. And this transformation is the key to healing and often reduces the aggressiveness of cancer and tumors. In the words of Dr. Bruce H. Lipton, "The moment you change your perception is the moment you rewrite the chemistry of your body."

We now understand that inflammatory processes can be modulated by the mind. Since stress, anger, and quick reactions all bring about inflammation and drive galectin-3, it makes sense that we can minimize inflammation by calming the mind.

Meditation is a lifelong exploration, and it's next to impossible to discuss it in just a few pages. However, I will try my best to do so! Meditation affects our cellular biology, epigenetics, and physiology and can have a profound impact on our health.⁸¹ My guess is that the majority of people who meditate do so to relax and feel better or because they want to feel happier. But when we do this with a focus on ourselves, we are approaching meditation from a survival point of view and from our own small, self-focused perspective. As a result, we limit the infinite healing power of meditation.

The most basic yet profound meditation is a practice that helps us *create* more spaciousness and calmness within our system. It is therefore called *calm abiding* or *shamata meditation*. When we find more spaciousness within, it creates a capacity in which love and compassion can then arise. When we engage in meditation with the understanding that all beings are caught in a state of contraction, it allows love and compassion to flow toward ourselves and others as we are all in the same boat. Let's take a few moments to walk through a simplified variation of this meditation practice.

Preparing for Meditation

Before we begin to meditate, we must enter a preparatory phase, just like we do when we get ready to detox. First, we prepare the body, and there are a few steps to this process. We can either sit on a cushion with our sit bones elevated or sit comfortably in a chair with our back straight. We prepare for meditation by letting go of our ongoing struggle with the gravitational force; we let our body and our sit bones sink into the seat.

Our perineum relaxes, allowing our diaphragm to relax as well. The breath can now flow more easily. We can lengthen our spine upward while keeping the back of the neck elongated. Our hands are resting on our knees, and our shoulders and elbows are relaxed. Our tongue gently touches the upper soft palate in a relaxed manner, and there is a slight opening between our teeth. Our eyes are open, and our gaze is soft.

Now that we've prepared our body, we can prepare our breath. We take a few deep breaths. We visualize that we bring white light into the body with our inhalation, and as we slowly exhale, we visualize that we are releasing all diseases, traumas, toxins, and negative emotions as a dark, black-gray color, like smoke, exiting our body. After doing this a few times, simply let your breath flow smoothly without effort. We want to regulate our breath so there is a normal flow of oxygen, giving us the energy and vitality to create change. Breathing is essential and keeps us alive, and creating regular, smooth breaths is a way to balance the reactive inflammatory process.

Next, we prepare the mind by opening our hearts to ourselves and to others through contemplation of the principle of equanimity. We do this by remembering that *everyone* wants to be happy and healthy, not just us. People we love, people we've never met, and even people we dislike all have

this same desire. We all want to be happy, and we all experience difficulties in our lives—these truths are equal in all of us. They unite us in our common humanity. The truth of experiencing difficulties and desiring happiness is what makes us all equal—this is the principle of equanimity within all of us. We're all on the same journey! This understanding opens our heart and expresses itself as love and compassion toward our own difficulties and the difficulties of others. It naturally softens us and weakens our reactive survival response. This is the ideal starting point for meditation and healing.

If we approach meditation with an open heart, we can bring happiness to ourselves and to others regardless of their belief system. We melt the isolation and disrupt the galectin-3-driven survival response. As a result, we improve our own well-being. As the Dalai Lama once said with his famous laughter, “To be selfless is a very good thing, from a selfish point of view.”

Finding Calm, Openness, and Clarity

Once our minds are prepared, we can begin meditation. When we start our meditation session, we need to slow and calm our mind and our system, especially if we are new to it. Bringing our gaze down and looking at an object beneath our eye level, like a small rock on the ground, can help us do this. We focus our gaze on the object of the meditation without letting our gaze wander. The eyes and the gaze are used as a doorway to settling the mind; when the gaze is fixed and settled, the mind can begin to settle as well. Resting the gaze on our chosen meditation object, we add the breath. We do this by feeling that we are exhaling into the object and inhaling from the object. We continue the breathing process without losing our visual concentration on the object. Then we add our mental

concentration by gently placing our attention on the object.

We utilize the gaze, the breath, and the mind in the meditation process by softly focusing all of them on one single object. In doing so, our mental distractions slowly fall away, and we find a place of peace and calmness. If your mind wanders, you feel restless, or you feel sleepy, don't worry. These are normal responses. Our neurotic, "inflamed" mind that has been in control for our entire lives is rebelling against the idea of being told what to do. But slowly over time, your sense of calm, openness, and clarity will expand. You'll start to find the nonconceptual space where thoughts fall away. This simple practice has profound health benefits on multiple systems: on our circulatory system, endocrine system, immune system, and nervous system.⁸² It's also very beneficial for depression and anxiety, and to counteract the side effects of chemotherapy.

After we've calmed our system, we can bring our gaze to our eye level, softly resting our gaze in the space in front of us. Using our breath as the anchor to our meditation, we open ourselves to all visual sensations that we experience. While maintaining this visual openness toward the front, we also open ourselves to all visual sensations on our right, behind us, on our left, and above and below. We do this without judgment or grasping, neither rejecting nor holding the experience. We simply accept our experience as it is. While being open to all visual sensations, we slowly bring the other senses into our awareness: what we hear, what we feel, what we smell, and what we taste.

With every breath, our field of experience expands. We pay special attention to the gap between the exhalation and the inhalation. It is here that we can let go into the nonconceptual space. Our body is still and quiet, our breath is flowing smoothly, and our mind slowly expands. We can continue

this phase for some time.

While maintaining this openness outwardly, we can bring our awareness into our body in the same way. We can observe our thoughts, our feelings, and our bodily sensations without grasping and without judgment. We try to maintain the openness both outwardly and inwardly. Once we are more comfortable doing this, we can let the conceptual boundary between the outside and the inside of the body fall away and simply rest in this vast openness.

Engaging our Healing Heart

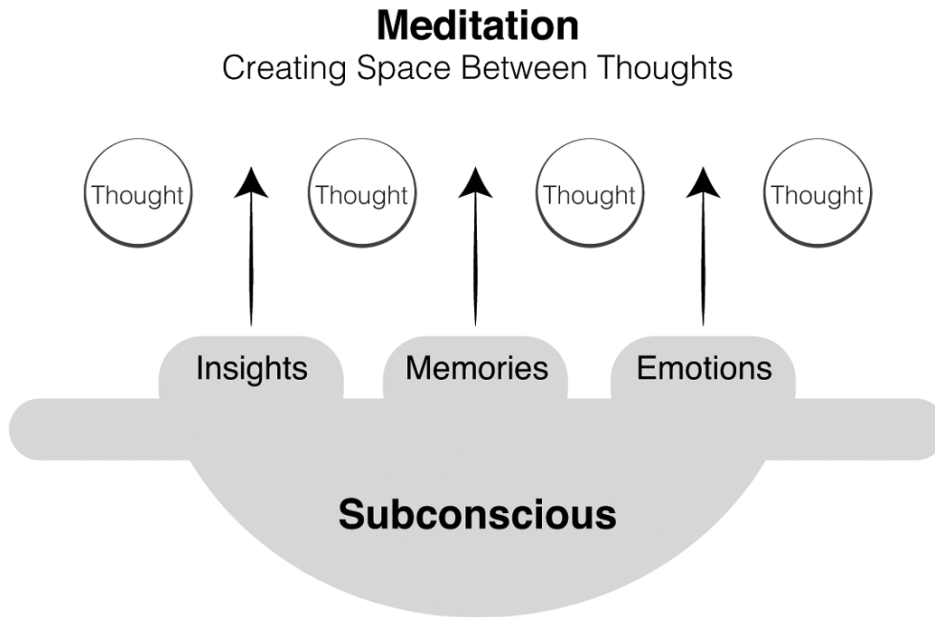
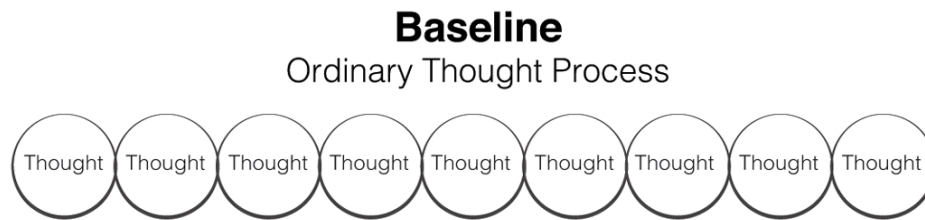
We've practiced the quality of openness in meditation. From this place of openness, we now connect to our infinite healing potential—to our hearts. Take a moment and place your open hands on your chest and say hello to your heart. Feel the warmth, love, and healing qualities of the heart spread throughout your chest and radiate wherever it needs to go until it fills your whole body. You can direct the warmth to specific areas in your body that require healing. Then let it spread outside your body and fill all of space.

Now bring your hands slowly back to your knees and simply rest. Experience that your body and the world outside of the body are inseparable. There's a sense of unity, of oneness. If your mind wanders away while trying to stay in the nonconceptual space, you can gently bring it back to the contemplation of equanimity, just as we did at the beginning of the session. Focus on love and compassion toward yourself and all beings, and then let go again. You may also contemplate the impermanent, ever-changing nature of all experiences and then let go. Feel free to go back and forth between analytical meditation and letting go in the nonconceptual space.

For guided-meditation resources, visit SurvivalParadox.com.

Creating Space for Insight and Transformation

Creating space means there is more space between our thoughts. Initially, we may simply become aware of how many thoughts we have, making it feel as though we have more thoughts when we first begin to meditate. These are all being discharged from our subconscious. When our thoughts run one after the other with no space in between them, we have no awareness of them. There is so much mental “noise” that there is no space for deeper thoughts, contemplations, feelings, or insights to arise from our depth to our consciousness. When we slow our mind, the space between our thoughts expands, allowing for thoughts, feelings, and insights that we were not aware of to arise.



There is no such thing as “good” or “bad” meditation. Anything and everything we experience changes eventually, as it is impermanent to begin with. Meditation is not about what we experience; it’s about our relationship to our experience and how we react to it. For example, are we grasping or pushing away our meditation experiences? If we hold on to them or try to push them away, we’ll have more of a survival-driven, reactive response. If we can simply let them be, letting go of trying to change or manipulate them, we’ll have a more detoxifying response. And if whatever arises from within generates love and compassion, it’s a genuine, transformative meditation practice led by the heart.

If we want to find greater freedom, we need to be comfortable with the

unknown. Living fearlessly without grasping puts us at the forefront of life. It gives us the ability to live in the moment. If we are truly free, we will not even *hold on* to the moment.

INSIGHT AND INNOVATION

When we live in the moment, we can find space for insight and innovation. Before we talk about innovation, let's discuss what the word means.

Innovation is a process or an action that spurs on change or transformation. It's bringing something to life that didn't exist before or changing something that exists and giving it a new or different function and meaning. A good example of evolving innovation is when my team and I began to research galectin-3. We had an idea in our minds about what this research would look like, but the end result was much different and better than anything we imagined. We initially focused on galectin-3's role in cancer, but as time went on, we discovered that it's at the root of multiple chronic diseases and aging. And over time, as the process unfolded, the role of galectin-3 as our survival protein and upstream regulator of so many processes made itself evident.

What allows the process of innovation to take place? The process of innovation has two parts. First, we have an insight, and an idea rises up inside of us. Something comes alive. The process can be aided and supported by meditation practice. By finding the space between our thoughts, we are open to deeper insights that we were not aware of.

The second part is the actual manifestation of the idea. This is the part where we present our concept or idea to others. It's the process of taking an insight and bringing it to life, bringing it to fruition. It's making old things new or creating something new that is visibly and practically useful to the

outside world.

I've created a lot of unusual inventions in my life. Medical devices, dietary supplements, clinical protocols, and the way I teach meditation are all examples.

Sometimes, when I make a medical invention, people ask me, "How did you come up with this idea, when scientists in the pharmaceutical industry couldn't think of it?" My answer is that the scientists were following the same trend of thought; they followed the same logical, rational, and skeptical approaches. They didn't give themselves the opportunity to break through their preconceived concepts and understanding. I am in no way smarter or brighter than any of these scientists. I'm simply trained in how to let go of preconceived concepts and ideas, which presents a greater possibility for inventiveness.

While you need insight for innovation, this must go beyond the mere possession of knowledge. You must also be willing to surrender and let go of your knowledge. In order to do this, we have to discover a deeper part of ourselves, and this brings us back to the concept of creating space. If our mind is constantly occupied, and one thought immediately leads into the next, there is no space for true insight or innovation. To really progress, we need to go through the process of "unlearning," which is profoundly different from not learning. First, we gain the knowledge and the solid baseline, and then we let go of it in the process of unlearning.

In order to create something new, we have to let go of something old. This means that detoxification and creating space is a *prerequisite for innovation*, just as it's a prerequisite for meditation and healing. This is why meditation is so helpful in this process.

Innovation is a kind of healing: a way of moving outside of or

transcending problems or patterns that no longer serve us. Whether it is from traditional modes of thinking that inhibit societal growth or lattice formations of galectin-3 that block the movement of molecules, human beings strive to transcend.

Fixation and grasping are death. Motion and change are life. This is the essence of the survival paradox: to have life, you cannot hold it. You must let go in order to live. Anyway, there is no such thing as “having” life—as if you could store it in a box on a shelf. To live is a verb, a movement. It exists only in constant change and motion as it travels within our bodies and between our hearts.

⁸¹ Sabrina Venditti, Loredana Verdone, Anna Reale, Valerio Vetriani, Micaela Caserta, and Michele Zampieri, “Molecules of Silence: Effects of Meditation on Gene Expression and Epigenetics,” *Frontiers in Psychology* 11 (2020), <https://doi.org/10.3389/fpsyg.2020.01767>.

⁸² Michaela C. Pascoe, David R. Thompson, and Chantal F. Ski, “Meditation and Endocrine Health and Wellbeing,” *Trends in Endocrinology & Metabolism* 31, no. 7 (2020): 469–77, <https://doi.org/10.1016/j.tem.2020.01.012>.

CONCLUSION

My journey into galectin-3 and MCP unknowingly began that evening when I was twelve, when my neighbor said the cure for cancer was in the peel of citrus fruits. This journey has led me to places that I never expected. The development of a promising natural compound to slow down the metastatic process in cancer unfolded into something much bigger. Along the way, I learned not only about the behavior of disease but also about the behavior of human beings—our instincts, passions, and reactions, and our unique ability to love, to heal, and to forgive.

While engaging in clinical, holistic medical care and research, I continued to deepen my meditation studies, training, and practice. I found that differing aspects of my life were more interrelated than I had realized. The same theme revealed itself wherever I looked: everything is connected, and there is an ongoing relationship between the macro and the micro. These understandings continue to inform my work.

The deeper I dove into medicine, the more I came to realize that the power of healing is within our hearts. This power is in each and every one of us, and in every cell in our body. Therefore, it also exists within every community and ecosystem.

This healing and transformation potential can express itself at any given moment; it can be unleashed when we transform our survival-driven reactivity into a heart-based, compassion-driven response. The transformative journey is limitless and ongoing—it's never-ending and

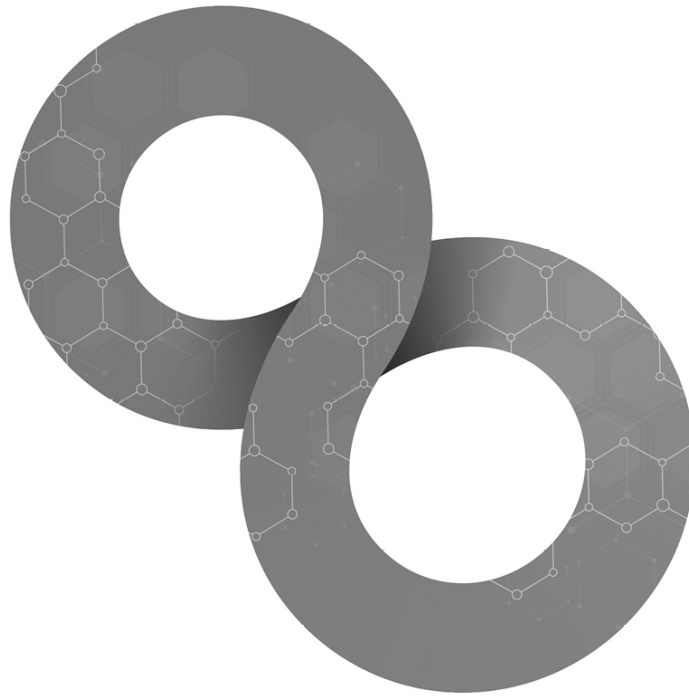
always changing. It offers us improved quality of life and health, and a deep and more meaningful life experience as we traverse this path.

When we participate in the process of healing ourselves, we become more open, and our isolation and survival tendencies fall away. Responses to treatments naturally become more powerful, and these can be influenced by spiritual approaches and practices like meditation, making psychological and emotional changes, and through sound nutrition and lifestyle changes. We're all on a journey, trying to move from survival to harmony.

The body naturally seeks harmony. This is also what communities naturally do when people have open-hearted engagement with one another, and innovation propels us toward healthy societal growth. And of course, ecosystems also seek to operate harmoniously. The human body knows how to survive—and needs this useful response—but we must not forsake harmony in the process. Harmony is so essential to our existence that it is even possible to understand the survival response in these terms. For what is the survival response other than an effort to regain harmony in the aftermath of imbalance! Unfortunately, the effects of the survival response—especially when it doesn't turn off—create other imbalances. Then the body responds to these new imbalances, creating more ill effects, to which we respond—and again and again. On this roller coaster, the survival response holds its reins tightly.

We need to take back the reins. But herein lies yet another paradox: we can only do so by loosening our stubborn grasp. Letting go of fixation—whether physically, emotionally, or psychospiritually—will help our survival response release its grip. This creates space both within us and between us. In that space, we will heal.

At the age of sixty, I decided it was time for me to write and share what I've learned on my journey over the last few decades. I'm in awe of the fact that my work as a physician, researcher, and meditator all lead me to the survival paradox and how to transcend it. I feel so fortunate to be able to address this fundamental shift from the perspective of science, cellular biology, and biochemistry, and through meditation. It's been an inspiring example of how mind and body can come together. And while this book contains no small amount of technical, scientific, and medical information, I hope you can see that it is all an expression of my heart.



SURVIVAL PARADOX APPENDIXES

APPENDIX A

MODIFIED CITRUS PECTIN DOSAGES AND GALECTIN-3 TESTING

GUIDELINES FOR THE USE OF MODIFIED CITRUS PECTIN

The only proven galectin-3 blocker available, low-molecular-weight Modified Citrus Pectin (MCP) is repeatedly shown to block and reverse the effects of unhealthy galectin-3 in numerous diseases. Derived from regular citrus pectin, the correct form of MCP is modified to precise specifications: molecular size of 3–13 kilodaltons and less than 5 percent esterification for bioactivity and bioavailability. When we researched our MCP with the USDA, we found that it contains 10 percent of rhamnogalacturonan II, which explains its unusual and unparalleled immune-enhancing effects. It is crucial that we have been able to modify the citrus pectin to a low molecular weight while preserving the rhamnogalacturonan II and creating a unique three-dimensional structure that makes it easier for this MCP to bind to galectin-3 and neutralize it.

MCP has important benefits in oncology, inflammation, and fibrosis. It provides nutritional support for different treatments, including chemotherapy, radiation therapy, antibiotic agents, and botanicals through synergistic mechanisms. It safely binds and eliminates heavy metals and environmental toxins from the body without disrupting essential minerals. It supports immune and antioxidant activity, and provides prebiotic benefits

in the digestive tract while promoting healthy bacterial growth.

MCP is also used as nutritional support for cardiovascular disease, kidney disease, obesity, liver disease, immune dysregulation, neurological conditions, metabolic disorders, and other inflammatory conditions.

If you are using MCP, make sure to use the correct, researched form. MCP's specific structure allows it to bind tightly to galectin-3 and halt its destructive actions.

Table 1—MCP Dosage by Condition

For all conditions, adjust the maintenance dose based on your health issues. If healthy with no conditions and under age 40, the maintenance dose is 5 grams per day. If healthy and over age 40, the maintenance dose is 5 grams twice per day.

Table 1: Modified Citrus Pectin Dosage by Condition

	SUPPORT STAGE	DOSAGE CAPS/POWDER	INSTRUCTIONS EMPTY STOMACH = 15 MIN BEFORE OR 1 HOUR AFTER FOOD (Gal-3 = Galectin-3)
Oncological Nutritional Support	Active	7.5 grams twice a day	20 grams / day if Gal-3 > 18 25 grams / day if Gal-3 > 25
	Maintenance	5 grams twice a day	Active dose for 5 years posttreatment / period of increased risk of recurrence. Then can follow maintenance dose.
	Surgery & Biopsy	10 grams twice a day	Take up to surgery / resume right after surgery: 10 grams twice a day, starting 1 week before, until 2 weeks after surgery.
Cardiovascular Support	Active	7.5 grams twice a day	
	Maintenance	5 grams twice a day	
Joint Support	Active	7.5 grams twice a day	
	Maintenance	5 grams twice a day	
Toxin Removal	Active	7.5 grams twice a day	
	Maintenance	5 grams once a day	
Neurological Support	Active	7.5 grams twice a day	
	Maintenance	5 grams twice a day	
Digestion & Intestinal Support	Active	7.5 grams twice a day	
	Maintenance	5 grams twice a day	
Immune Support	Active	7.5 grams twice a day	
	Maintenance	5 grams twice a day	

Dose Calculations

Each scoop of plain or lime **PectaSol**® MCP powder has 5 grams MCP.
Each **PectaSol**® MCP capsule contains 800mg / 4.8 grams per 6 caps.

GALECTIN-3 TESTING AND MCP DOSAGES

Since its inception in 2011, I have ordered and reviewed thousands of galectin-3 tests and developed unique expertise in interpreting galectin-3 levels.

Since levels of galectin-3 increase as we age and can vary due to genetic tendencies, over time it became clear to me that galectin-3 levels can't be used to determine whether or not to use MCP or to determine the dosage. I generally recommend MCP based on a patient's condition (as shown in Table 1) rather than their levels of galectin-3.

However, I continue to test galectin-3 levels for the following reasons:

- If a patient has elevated levels of galectin-3, and I see a correlation between clinical changes and galectin-3 levels, I will use galectin-3 as a marker to monitor their condition.
- In fibrotic diseases, especially in chronic kidney disease (CKD), I will use galectin-3 as a useful marker to determine CKD and fibrotic status of the disease.
- If a patient has higher levels of galectin-3, I'll adjust the dose of MCP as needed. If they have higher levels of galectin-3, they will need more MCP in order to block a larger amount of galectin-3.
- If a seemingly healthy patient has a high initial baseline of galectin-3, it indicates a need to look for fibrotic diseases or an explanation as to why their levels are high. I will recommend a dosage of MCP that is higher than that for a healthy person with

low levels of galectin-3.

For more information about modified citrus pectin and galectin-3, visit SurvivalParadox.com.

APPENDIX B

OTHER INGREDIENTS AND COMPOUNDS

In addition to MCP, the ingredients and formulas listed here represent some of the most powerful healing agents I've found useful in numerous acute and chronic conditions. These compounds can be used alone or combined together into a comprehensive protocol for optimal clinical outcomes.

This information is provided for educational purposes only and not intended to serve as medical advice. When treating any condition, it's essential to work with a trained healthcare practitioner.

INGREDIENTS

Artemisinin—A natural compound derived from the plant *Artemisia annua* (sweet wormwood). Used in the treatment of cancer, malaria, and other parasitic and microbial infections, including chronic Lyme disease and babesiosis. It is best to use an artemisinin complex blend, which includes the whole *Artemisia annua* herb, plus *Artemisia annua* extract, and the compound artemisinin, because this type of synergistic formula is more effective and better tolerated. Artemisinin can increase liver enzymes, so liver function needs to be monitored. Take intermittently, four days on and three days off. Take with food, preferably with fatty foods, for optimal absorption.

Alpha-Lipoic Acid—A naturally occurring, key antioxidant compound produced by the body and available as a supplement. Powerful anti-inflammatory and free radical scavenger. Essential cofactor in several mitochondrial processes. Can be used in diabetes (including diabetic neuropathy), cancer (apart from conventional treatments), Alzheimer's disease, neurological disease, and other inflammatory conditions. Recycles other antioxidants, including vitamin E and glutathione. Supports mitochondrial energy production, manages gene transcription, supports glucose and lipid metabolism, reduces insulin resistance, increases antioxidant capacity, helps remove heavy metals from the circulation. The only fat and water-soluble antioxidant, it is capable of crossing cell membranes to exert antioxidant activity both inside and outside of cells. Dosages vary by condition.

Berberine—A phytochemical found in certain botanicals, such as goldenseal and Oregon grape. Powerful antioxidant and anti-inflammatory with cholesterol-lowering and blood sugar-balancing effects. Works on numerous pathways to reduce unhealthy inflammation and increase antioxidant capacity. Used in diabetes, cancer, and other inflammatory conditions.

Boswellia—A resin extract of the Boswellia tree (frankincense). Powerful anti-inflammatory that regulates multiple cellular processes. Used to treat cancer, inflammatory bowel disease, arthritic diseases, asthma, brain edema, neurological disease, and other inflammatory conditions. Protective effects during radiation therapy. Especially important to use with brain radiation for glioblastoma (GBM). Dosages vary by condition.

Curcumin—An active compound derived from turmeric. Powerful antioxidant and anti-inflammatory. Favorably modulates gene expression

in numerous areas. Used in cancer, obesity, diabetes, neurodegenerative diseases, psoriasis, allergies and asthma, inflammatory bowel diseases, and cardiovascular disease. Curcumin has been determined to play an important role in regulating cytokines, kinases, enzymes, transcription factors, growth factors, receptors, and metastatic and apoptotic molecules. Dosages vary based on absorption capacity and bioavailability. Best absorbed when taken with fatty foods.

Cannabidiol (CBD)—A nonpsychoactive compound derived from hemp, with multiple mechanisms and indications. Interacts with numerous receptors in the body to favorably modulate cell signaling and expression in cancer, Alzheimer's disease, Parkinson's disease, multiple sclerosis, epilepsy, Huntington's disease, hypoxia-ischemia injury, pain, anxiety, depression, nausea, inflammatory diseases, rheumatoid arthritis, infection, inflammatory bowel and Crohn's disease, cardiovascular disease, and diabetic complications. Dosages vary by condition.

Honokiol—A highly active extract purified from *Magnolia officinalis* bark (and one of my favorite and most commonly recommended compounds). A powerful antioxidant, anti-inflammatory, anticancer, antimicrobial, antidiabetic, and neuroprotective compound. Exerts multiple actions on the cellular and genetic levels, favorably modulating genetic expression, metabolism, and cell signaling in numerous conditions. Small molecular size allows it to cross the blood-brain barrier for neurological health and protection.

As an anticancer agent, honokiol regulates the cell reproduction cycle. It induces programmed cell death in cancerous and abnormal cells. It has direct cytotoxic activity against cancer cells while protecting healthy cells. Unique synergistic effects with multiple cancer treatments, including

biological agents, chemotherapy, radiation therapy, and immunotherapy. It also demonstrates synergistic action with MCP against numerous conditions.

Neurological benefits include protection against amyloid-beta plaque accumulation in Alzheimer's disease, reversal of progressive neuron damage in Parkinson's disease, support for healthy nerve cell growth, and reduction of neuroinflammation. Supports neurotransmitter activity. Enhances gamma-aminobutyric acid (GABA) activity in the brain and promotes relaxation and rapid eye movement (REM) sleep cycles.

Dosages:

- Sleep: 250–500 mg before bed
- Anxiety: 250–500 mg twice daily
- Anti-inflammatory and circulation support: 500 mg twice daily
- Nutritional support in cancer: Build up to 1 gram, three times daily

Take with food, preferably fatty food. Build up to optimal dose gradually. Due to honokiol's relaxing effects, some people can feel drowsy.

The most common side effect is diarrhea, which is dose-dependent and usually self-resolves. Stop using if you experience diarrhea.

Medicinal Mushrooms—There are over 270 identified species of medicinal mushrooms, each with unique therapeutic properties. Some of the most beneficial and researched varieties include reishi (*Ganoderma lucidum*), Cordyceps (*Cordyceps sinensis*), coriolus (*Trametes versicolor*), Agaricus (*Agaricus blazei*), Polyporus (*Polyporus umbellatus*), Hericium

(*Hericium erinaceus*), wood ear (*Auricularia auricula*), shiitake (*Lentinula edodes*), and maitake (*Grifola frondosa*), among others.

Medicinal mushrooms are rich sources of unique health-promoting compounds that deliver multiple benefits for key areas of health. In immunity, mushrooms act as immune system trainers, helping to regulate immune expression to better respond to threats while, at the same time, tempering down overactive inflammatory immune reactions. Mushrooms act like scavengers in the body, cleaning up stagnant areas where toxins, waste, infections, and unhealthy tissue have accumulated. They are extremely safe and can be used in high doses when needed.

Melatonin—A master hormone and neurotransmitter, primarily released by the pineal gland. Regulates sleep/wake cycles by synchronizing circadian rhythms and inducing drowsiness in response to darkness. Used as a supplement for sleep disorders and to restore circadian rhythms following jet lag, night-shift work, etc. Used at higher doses in the treatment of cancer, neurological disease, and other conditions. It offers powerful antioxidant actions, immune support, and additional benefits. It can be used at a microdose as low as 0.25 mg or in high doses of 20–60 mg, depending on condition and tolerance. The main side effect is daytime sleepiness and disturbed sleep. Should be taken before bed, best around 10 p.m.

Quercetin—A flavonoid polyphenol found in many varieties of plants, fruits, vegetables, and grains. Powerful antioxidant, anti-inflammatory, and anticancer actions. Used to treat allergies, cancer, diabetes, immune dysregulation, and other conditions. Quercetin is one of the flavonoids with the most potent antioxidant properties.

Vitamin D3—Bioactive form of vitamin D. Essential for mineral

metabolism and calcium, phosphate, and magnesium uptake/utilization. Involved in healthy cell growth and differentiation. Used to treat bone disorders. Essential for immunity, cognitive function, neurological health, insulin regulation, and anticancer support. Dosages vary by blood levels and condition.

FORMULAS

Botanically-Enhanced Medicinal Mushroom Formula (MycoPhyto®)

This targeted immune-support formula utilizes six species of medicinal mushrooms that are cultivated through a unique method: coriolus (*Trametes versicolor*), reishi (*Ganoderma lucidum*), Agaricus (*Agaricus blazei*), Cordyceps (*Cordyceps sinensis* isolate), Polyporus (*Polyporus umbellatus*), and maitake (*Grifola frondosa*).

These mushrooms are cultivated on a milled blend of immune-supportive and anti-infectious herbs and organic brown rice. This innovative approach utilizes the fungi's ability to absorb nutrients from their growing environment. The specialized herbal growth medium imparts additional immune-supportive properties to the mushrooms. Adding specific nutrients to the mushroom growth medium allows the nutrients to become incorporated into the full-grown mushroom mycelia, resulting in fortified mushrooms with enhanced health benefits.

Especially useful for long-term immune support. It can be used at a higher dose if the immune system is under strain, high stress, or at a greater risk for infections.

Dosages:

- Maintenance: 3 capsules (½ scoop), twice daily
- Immune support: 6 capsules (1 scoop), twice daily
- Can take higher doses during times of stress or high risk of infection.

Glyphosate Protection Formula (GlyphoCleanse®)

Detox formula designed to help remove glyphosate and other agricultural pesticides and chemicals, as well as environmental toxins from the body. Four researched ingredients help remove agricultural toxins from the body, prevent them from being stored in tissues and organs, and protect against damage. The amino acid glycine supports the gut lining, prevents damage to the gut from different toxins, and has a cell protective effect systemically and in the brain. It may help counteract the damaging effects of glyphosate in the gut and nervous system. Glycine also supports the production of master antioxidant glutathione for enhanced detox abilities. Alginates bind to toxins in the GI tract, including herbicides and radioactive particles, allowing for safe elimination. Icelandic kelp helps remove fluoride, bromide, and chloride, and other pesticides and environmental toxins. Regular citrus pectin binds toxins and cholesterol in the GI tract and supports a healthy microbiome.

Live Fermented Botanical and POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic™)

I always prefer to use a pre- and probiotic product that has live benefits. My favorite pre/probiotic by far, based on years of clinical experience, is ecoProbiotic: a high-potency natural symbiotic drink, with eight clinically

studied strains of live lactic acid bacteria, fermented with a blend of nineteen organic herbs and prebiotic pectic oligosaccharide (POS). This highly bioavailable, bioactive, synergistic formula supports a healthy microbiome with benefits for digestive health, nutrient absorption, digestive motility, GI tract integrity, and immunity.

MCP and Alginates (PectaClear®) –Heavy Metal Detoxification

Pectin and alginates are classified as polyuronides. Polyuronides can remove positively charged toxic metals. Notably, lead, mercury, cadmium, arsenic, and radioactive compounds have a higher binding affinity for polyuronides than essential ions like calcium, magnesium, and zinc. Toxic metal ions become trapped in the polyuronic structure and are safely eliminated from the body. This formula is shown in clinical studies to safely remove heavy metals and radioactive ions from the body without affecting essential minerals.

Polybotanical Breast Formula

Powerful anticancer formula shown in four published preclinical studies to halt growth and metastasis of aggressive breast cancer cells, including triple-negative and hormone receptor-positive cells. The formula promotes favorable cell signaling and genetic expression, reduces aggressive breast cancer cell behavior, helps prevent metastasis from primary tumors, and reduces the number and size of breast tumors. The formula has been shown to enhance the effects of tamoxifen and aromatase inhibitors in the treatment of estrogen receptor-positive (ER+) breast cancer. It's also been shown to work synergistically with MCP against breast cancer. Ingredients include quercetin, bioavailable curcumin, astragalus root extract, *Scutellaria*

barbata extract, DIM (Diindolylmethane), and botanically enhanced medicinal mushrooms *Coriolus versicolor*, *Ganoderma lucidum* (reishi), and *Phellinus linteus*.

Polybotanical Prostate Formula

A thirty-three-ingredient, multivitamin, poly-botanical nutritional supplement formulated to target prostate cancer, as well as prostate and urinary issues. Contains extracts of turmeric, nettle leaf, astragalus, saw palmetto berry, grape skin, pomegranate fruit, Chinese smilax rhizome, broccoli, skullcap leaf, Chinese skullcap root, dandelion, resveratrol, eleuthero root, and other ingredients. Research demonstrates that this poly-herbal and nutrient preparation inhibits aberrant cell proliferation, induces apoptosis, inhibits invasiveness of a variety of prostate cancer cell lines, and provides clinical relief of prostate and urinary symptoms. Also shown to work synergistically with MCP against prostate cancer.

Radiation, EMF, and Environmental Exposure Protection Formula (CellularShield®)

CellularShield® is a researched blend of antioxidants, botanically grown medicinal mushrooms, herbal extracts, and biologically active nutrients. Formulated to provide antioxidant protection against free radicals and physiological disruptions from EMFs and different forms of ionizing radiation. Also promotes healthy immune and cellular energy functions. Contains vitamins C, E, B12, folate, magnesium, zinc, selenium; botanically grown mushrooms Cordyceps (*Cordyceps sinensis*), reishi (*Ganoderma lucidum*), oyster mushrooms (*Pleurotus ostreatus*); extracts of astragalus root (*Astragalus membranaceus*), ashwagandha root (*Withania somnifera*), cat's claw bark (*Uncaria tomentosa*), Boswellia resin (*Boswellia serrata*),

green tea leaf (*Camellia sinensis*), holy basil leaf (*Ocimum sanctum*), black pepper fruit (*Piper nigrum*); trimethylglycine (TMG), alpha-lipoic acid, Methylsulfonylmethane (MSM), N-acetyl L-cysteine (NAC), blueberry fruit (*Vaccinium angustifolium*), taurine, acetyl-L-carnitine, and mixed tocopherol/tocotrienols.

Tibetan Herbal Padma Formula (Padma Basic®)

A powerful herbal supplement produced in Switzerland based on a time-honored Tibetan formula. Clinically proven to offer comprehensive benefits for cardiovascular, circulatory, and immune health. This blend contains nineteen botanical ingredients, along with natural camphor and calcium sulfate to support healthy immune function, combat free radicals, and support cardiovascular and circulatory health. The formula is rich in active ingredients such as tannins, flavonoids, polyphenols, and essential oils, which work together to support immunity, antioxidant activity, circulation, and cardiovascular function. More than forty years of clinical, peer-reviewed research and dozens of published papers confirm the unique benefits of this formula in cardiovascular conditions, infections, and other areas.

Total-Body Detox Formula (ecoDetox®)

Comprehensive detox formula that supports the natural detox functions of the body's elimination systems. Combines botanical extracts, antioxidants, and nutrients to optimize the detoxification capacity of the liver, kidneys, and other detox organs. Fights free radicals and supports cellular energy. Extracts of cilantro, goldenrod, astragalus, milk thistle, dandelion, and ginkgo provide targeted support for phase 1 liver detoxification.

Antioxidants and amino acids such as MSM (Methylsulfonylmethane),

NAC (N-acetyl cysteine), alpha-lipoic acid, and L-cysteine support phase 2 liver detoxification. This formula also contains trimethylglycine, L-methionine, and other nutrients shown to promote proper methylation support, enhanced detoxification capacity, and long-term health.

For more information on formulas, ingredients, and compounds, visit SurvivalParadox.com.

APPENDIX C

DIETS

Diet is one of the most important foundations for long-term health and wellness. Certain diets and dietary approaches can be particularly helpful in reducing inflammation in the body, while delivering timely and critical nutritional support to prevent and reverse a number of degenerative conditions. When significantly changing your diet for the treatment of a condition, it's essential to consult with your healthcare practitioner to determine what's ideal for your unique case.

LOW GLYCEMIC, INSULIN-SPARING DIET

This diet is one of the most versatile and adaptable, as it emphasizes nutrient-dense whole foods that nourish the body and reduce inflammation. The central focus is to limit foods that cause blood sugar to spike quickly, focusing on “low glycemic foods.” This helps to control inflammation caused by blood sugar and insulin spikes while delivering steady energy levels throughout the day. It also helps to reduce growth factors that can feed cancer, infections, and other conditions.

The “glycemic index” is a measurement system from 1–100 that's used to determine how high and how fast your glucose may rise after eating a specific food.

Refined sugars and processed foods tend to be much higher on the index than legumes or nonstarchy vegetables. Unprocessed, complex carbohydrates, proteins, healthy fats, and green vegetables tend to be low

on the index. **Items on the index below 55 are considered low-glycemic foods.**

There are numerous online resources that list the glycemic index values of common foods within a simple chart or table. Table 2 is an example of a glycemic index food chart based on information presented by the American Diabetes Association.⁸³

Table 2: Glycemic Index Food Chart

BREAKFAST CEREALS	Glycemic Index (Glucose = 100)
Cornflakes	81 ± 6
Instant oat porridge	79 ± 3
Rice porridge/congee	78 ± 9
Wheat flake biscuits	69 ± 2
Muesli	57 ± 2
Porridge, rolled oats	55 ± 2

VEGETABLES	Glycemic Index (Glucose = 100)
Potato, instant mash	87 ± 3
Potato, boiled	78 ± 4
Sweet potato, boiled	63 ± 6
Potato, French fries	63 ± 5
Vegetable soup	48 ± 5
Carrots, boiled	39 ± 4

HIGH-CARBOHYDRATE FOODS	Glycemic Index (Glucose = 100)
White wheat bread	75 ± 2
Whole wheat bread	74 ± 2
White rice, boiled	73 ± 4
Brown rice, boiled	68 ± 4
Couscous	65 ± 4
Udon noodles	55 ± 7
Rice noodles	53 ± 7
Sweet corn	52 ± 5
Spaghetti, white	49 ± 2
Spaghetti, whole meal	48 ± 5
Corn tortilla	46 ± 4
Barley	28 ± 2

FRUIT & FRUIT PRODUCTS	Glycemic Index (Glucose = 100)
Watermelon, raw	76 ± 4
Pineapple, raw	59 ± 8
Mango, raw	51 ± 5
Banana, raw	51 ± 3
Orange juice	50 ± 2
Strawberry jam/jelly	49 ± 3
Peaches, canned	43 ± 5
Orange, raw	43 ± 3
Dates, raw	42 ± 4
Apple juice	41 ± 2
Apple, raw	36 ± 2

LEGUMES	Glycemic Index (Glucose = 100)
Lentils	32 ± 5
Chickpeas	28 ± 9
Kidney beans	24 ± 4

NOTE

Items on the index that are **below 55** tend to conserve insulin and are considered low glycemic index foods.

Kidney beans	24 ± 4	
Soya beans	16 ± 1	

KETOGENIC DIET

The ketogenic diet has gained enormous popularity in recent years, touted as a way to achieve optimal weight, control neurological diseases, and help treat cancer, among other benefits. However, this type of diet is not for everyone since the high intake of fat and protein can be taxing for vital organs. For this reason, in my practice, I generally recommend variations of the ketogenic diet to support cancer treatment, mainly around chemotherapy and radiation.

Since cancer uses sugar as its main source of energy, a modified ketogenic diet, often combined with intermittent fasting, can be helpful to starve cancer and induce important metabolic changes in a tumor to make it more responsive to treatment. This is particularly effective when done just prior to a patient receiving chemotherapy and radiation therapy, making the cancer cells more susceptible to these treatments.

The ketogenic diet requires a dramatic restriction of carbohydrates and an emphasis on healthy fats to shift the body to use fat rather than glucose as fuel. A standard keto diet recommends that about 75 percent of daily calories come from fat, 20 percent from protein, and only 5 percent from carbs. Specific test strips called “ketone body tests” can be used at home to test for ketones in the urine. This helps to determine if the body has shifted to using fat as fuel.

The exact amount of calories your body needs on a ketogenic diet depends on a number of factors, including body weight, activity level, and health goals. To help you fine-tune a ketogenic diet and determine your

optimal caloric intake, there are a number of free “keto food calculators” available online, as well as apps that can be downloaded and customized. These can help determine exactly how many calories from each nutritional group you’ll need on a ketogenic diet.

INTERMITTENT FASTING

Intermittent Fasting (IF) is a fairly simple dietary approach: limit eating to a specific “window” throughout the day, and restrict calories for the remaining hours of the day. It’s fine to drink water and tea during the fasting period. A common approach is the 16/8 method: Fast for 16 hours and eat only during an 8-hour window. For example, you might eat your first meal at 9 a.m. and end your last meal at 5 p.m., while restricting all caloric intake until 9 a.m. the following morning. The timing of the fasting is important. It is best to start eating early in the day and begin the fasting earlier in the afternoon.

IF gives your digestion and metabolism a chance to rest, which is especially important when we sleep because the rest helps to optimize repair processes. Prolonged fasting is also shown to trigger favorable changes in gene expression and cell signaling, activating certain genes that promote longevity and limit age-related deterioration on a number of levels. However, prolonged fasting can severely deplete vital nutrients and weaken the system. IF offers many important benefits of fasting without placing strain on your system.

When combined with a ketogenic diet, IF can be especially helpful with chemotherapy and radiation as a way to enhance efficacy and reduce the side effects of these treatments. In my clinic, I tailor this approach to the individual and their needs. Patients often report reduced digestive side

effects, better tolerance to the treatments, more energy, and improved overall well-being.

APPENDIX D

THERAPEUTIC GUIDELINES FOR MAJOR CONDITIONS

This section highlights some of the top integrative strategies, from diet to supplements, that are frequently recommended as a foundation for individualized protocols in treating major conditions. These strategies are provided as guidelines based on my research and clinical experience, and are intended to be educational only. These are not intended to diagnose or treat any disease or medical condition. It is essential to work with a qualified healthcare practitioner to guide your integrative care.

General dosing is provided for some of the supplements and botanicals. See previous appendixes for a brief explanation, as well as additional dosing guidelines for some of these ingredients, formulas, and approaches.

CANCER AND ONCOLOGY SUPPORT

No two cancer protocols are alike—each person's program must encompass individualized recommendations that address the multiple layers of their unique circumstances. Nevertheless, research shows that there are a handful of powerful natural agents and therapies that offer comprehensive support during anticancer protocols.

These multifaceted anticancer approaches can help give us the upper hand against this disease as part of an integrative, therapeutic cancer

protocol. My personal approach advocates and follows the integration of conventional treatments with complementary support.

Supplements and Formulas

Primary Anticancer Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day. Can be used with chemotherapy, radiation therapy, pre and post surgery, immunotherapy.
- Honokiol: 500 mg to 1 gram, 3 times/day, with food. Build up gradually over several days. Ideal for inducing synergistic effects with other therapies, including MCP.
- Artemisinin (artemisinin complex is preferable): Artemisinin can increase liver enzymes, so liver function needs to be monitored. Take 4 days on, 3 days off, with food, preferably fatty food. Taking 1-2 capsules of artemisinin complex with food during radiation therapy days can help potentiate treatment.
- Poly Botanical Breast Formula: for use in the support of breast-cancer treatments
- Poly Botanical Prostate Formula: for use in the support of prostate-cancer treatments

Additional Immune Support

- Botanically Enhanced Medicinal Mushroom Formula (MycoPhyto®): 6–9 capsules (1–1.5 scoops), 2 times/day
- Quercetin

- Tibetan Herbal Padma Formula (Padma Basic®)
- Botanical/POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic™)

Anti-Inflammatory and Circulation Support

- Tibetan Herbal Padma Formula
- Curcumin
- *Salvia miltiorrhizae* (dan shen)
- Nattokinase
- Lumbrokinase
- Tocotrienols
- Medicinal mushrooms *Cordyceps sinensis* and *Ganoderma lucidum*
- Quercetin
- Boswellia
- Vitamin D3 plus K2
- Melatonin

Mitochondrial and Energy Support at the Intracellular Level (not to be used during chemo and radiation therapy)

- Alpha-lipoic acid
- Vitamins B1, B2, and B6
- Carnitine and acetyl-L-carnitine

- Co-Enzyme Q-10

Diet

Low Glycemic Anti-Inflammatory Diet

Cancer thrives on glucose. A diet that's low in glucose (including natural forms of glucose), and low in foods that spike glucose and insulin, is critical to starve the cancer and reduce inflammatory cascades. When blood glucose and insulin are kept within normal ranges, we limit the production of numerous cancer growth factors and proinflammatory, pro-oxidant compounds. Glucose also damages the immune system, so for optimal anticancer abilities, we must limit glucose and other foods that cause glucose to spike. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

Intermittent Fasting

A calorie-restricted diet can be helpful with radiation therapy and around chemotherapy days, especially with drugs that create ROS (Reactive Oxidative Species). It is often combined with a ketogenic diet on these days. (See also Appendix C.)

CARDIOVASCULAR AND KIDNEY DISEASE

Cardiovascular disease can take many forms—from high blood pressure and elevated oxidized cholesterol lipoprotein(a) to coronary artery disease, heart failure, cardiomyopathy, and others. Nevertheless, core strategies to address cardiovascular health remain consistent. Therapeutic goals include reducing inflammation, boosting circulation, supporting heart function, improving oxygenation, and reducing oxidative stress. In addition to diet

and exercise, targeted nutrients and botanicals can offer critical support.

Since the heart and kidneys are closely connected, similar strategies are important for addressing kidney health and supporting optimal renal function. With chronic kidney disease, regardless of the etiology, reducing inflammatory and fibrotic processes is essential.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day.
- For advanced kidney disease with an EGFR under 20, reduce to 5 grams, 2 times/day; and for EGFR under 15, reduce to 5 grams/day.

Circulation Support

- Tibetan Herbal Padma Formula
- Curcumin
- *Salvia miltiorrhizae* (dan shen)
- Nattokinase
- Lumbrokinase
- Tocotrienols
- Medicinal mushrooms

Anti-Inflammatory Support

- Honokiol

- Quercetin
- Curcumin
- Tibetan Herbal Padma Formula
- Boswellia
- Bromelain

Antioxidant Support

- Well-balanced mineral supplementation with sufficient zinc. Beware of iron overload, as it can be damaging to the circulation.
- Tibetan Herbal Padma Formula

Mitochondrial and Energy Support

- Adaptogenic herbs will also support healthy circulation and cardiovascular support: astragalus, ginseng, eleutherococcus, ashwagandha, and others
- Medicinal mushrooms: especially *Cordyceps sinensis*, *Ganoderma lucidum*, oyster mushrooms
- Alpha-lipoic acid
- Vitamins B1, B2, and B6
- Carnitine and acetyl-L-carnitine
- Co-Enzyme Q-10
- NAD⁺ (nicotinamide adenine dinucleotide)

Detoxification Cofactors

- Sulfured amino acids to support the glutathione pathways

Diet

Low Glycemic Anti-Inflammatory Diet

Sugar drives inflammation, a key factor in cardiovascular and kidney disease. A diet that's low in sugar (including natural forms of sugar) and low in foods that spike glucose and insulin is critical to reduce inflammatory cascades and support healthy circulation and heart function. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

Low Protein Diet

Excessive protein intake, particularly animal protein, can be hard on the kidneys due to the amount of waste products produced by protein metabolism. When the kidneys are compromised, the body doesn't process these waste by-products properly, and they can build up, causing further damage. For those with kidney issues, emphasizing easily digestible foods, plant proteins, and a small amount of high-quality animal protein, such as fish, is important. Pesticides in general, and glyphosate in particular, can cause kidney damage. Eating organic foods and using a supplement such as GlyphoCleanse is very important in supporting kidney health.

LIVER CONDITIONS

Cirrhosis is one of the most common liver diseases, driven by chronic inflammation and fibrosis of the liver, leading to liver failure. Other chronic liver conditions can have a similar progression. Primary integrative treatment strategies include halting and reversing liver tissue damage, and

supporting optimal liver detoxification and antioxidant pathways.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Antioxidant Support

- Well-balanced mineral supplementation with sufficient zinc
- Tibetan Herbal Padma Formula
- Honokiol
- Alpha-lipoic acid
- N-acetyl cysteine
- Co-Enzyme Q-10
- Curcumin

Detoxification Support

- Sulfured amino acids to support the glutathione pathways
- Milk thistle—silymarin
- Dandelion

Diet

Low Glycemic, Anti-Inflammatory Diet

A diet that's low in glucose (including natural forms of glucose) and low in

foods that spike glucose and insulin is critical to reduce inflammatory cascades and support healthy liver function. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

Intermittent Fasting

Overeating, particularly in the evening, is hard on the liver. By reducing the digestive burden on the liver, intermittent fasting can give the liver time to process food and toxins and helps to regenerate liver tissue. However, the liver can't handle prolonged fasting. Most importantly, do not eat three hours before bedtime. Don't fast for more than fourteen hours without guidance from a healthcare practitioner. (See also Appendix C.)

LUNG DISEASE

Pulmonary issues and respiratory diseases can be extremely complex, with numerous causes and factors. Reducing inflammation, supporting immune function—including the microbiome—and promoting optimal oxygen exchange are key treatment strategies.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Anti-Inflammatory Support

- Tibetan Herbal Padma Formula
- Honokiol
- Alpha-lipoic acid

- N-acetyl cysteine
- Co-Enzyme Q-10
- Curcumin

Immune Support

- Tibetan Herbal Padma Formula
- 10 Mushroom Formula: 4 capsules, 2 times/day
- Botanical/POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic)
- Vitamin D3

Respiratory Support

- Medicinal mushrooms: *Cordyceps sinensis*, *Ganoderma lucidum*, and *Tremella fuciformis* (Bai Mu Er)
- Mullein
- Thyme

Diet

Low Glycemic, Anti-Inflammatory Diet

A diet that's low in glucose (including natural forms of glucose) and low in foods that spike glucose and insulin is critical to reduce inflammatory cascades and support healthy lung function. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

ARTHRITIS AND JOINT HEALTH

Inflammation is particularly noticeable in the joints. Key integrative strategies for addressing arthritis and joint conditions include targeting inflammation, improving circulation to joint tissue, and keeping joints lubricated with good hydration and healthy fats.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Anti-Inflammatory Support

- Tibetan Herbal Padma Formula
- Honokiol
- Alpha-lipoic acid
- N-acetyl-cysteine
- Co-Enzyme Q-10
- Curcumin
- Boswellia
- Quercetin

Circulation Support

- Tibetan Herbal Padma Formula
- *Salvia miltiorrhizae* (dan shen)

- Bromelain
- Tocotrienols
- Medicinal mushrooms *Cordyceps sinensis* and *Ganoderma lucidum*
- DHA/EPA omega fatty acids

Diet

Low Glycemic, Anti-Inflammatory Diet

A diet that's low in glucose (including natural forms of glucose) and low in foods that spike glucose and insulin is critical to reduce inflammatory cascades and support healthy joints. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

Intermittent Fasting

Intermittent fasting can help reduce inflammation and the burden of proinflammatory compounds that can accumulate in joints. Be sure to maintain adequate hydration for optimal joint health. (See also Appendix C.)

METABOLIC SYNDROME AND DIABETES

Adult-onset diabetes (Type 2 Diabetes) and its precursor, metabolic syndrome, are driven by inflammation and mitochondrial dysfunction, resulting in abnormal cellular metabolism and the inability to control blood glucose and insulin. In most cases, these conditions can be reversed with diet, exercise, and targeted supplementation. Therapeutic strategies include reducing inflammation, normalizing cellular metabolism, and supporting

glucose metabolism.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Anti-Inflammatory Support

- Tibetan Herbal Padma Formula
- Curcumin
- Honokiol

Mitochondrial and Metabolic Support

- Alpha-lipoic acid
- Vitamins B1, B2, and B6
- Carnitine and acetyl-L-carnitine
- Co-Enzyme Q-10
- NAD⁺ (nicotinamide adenine dinucleotide)

Glucose and Insulin Balance

- Cinnamon
- Fenugreek
- Gymnema
- Chromium picolinate

- Berberine

Diet

Low Glycemic Anti-Inflammatory Diet

Naturally, a low glycemic diet is extremely important in controlling diabetes and metabolic syndrome. A diet that's low in glucose (including natural forms of glucose) and low in foods that spike glucose and insulin is critical to reduce damaging glucose spikes that lead to insulin resistance. (The Glycemic Index Chart in Appendix C shows examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

Intermittent Fasting

Intermittent fasting is shown to help treat metabolic syndrome and diabetes by supporting healthy weight loss, improving insulin function, and balancing blood glucose. (See also Appendix C.)

NEURODEGENERATIVE DISEASE

To address neurodegenerative disease, the focus is on reducing the chronic inflammation and oxidative stress that can be so damaging to the nervous system. We also want to support the metabolic functions of the nervous system and support optimal neurotransmitter function.

Supplements and Formulas

Primary Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Anti-Inflammatory Support

- Tibetan Herbal Padma Formula
- Honokiol
- Curcumin
- Boswellia

Mitochondrial and Metabolic Support

- Honokiol
- Alpha-lipoic acid
- Carnitine and acetyl-L-carnitine
- Co-Enzyme Q-10
- Medicinal mushrooms: cordyceps and maitake (*Grifola frondosa*)
- Vitamin D3

Neurotransmitter Support:

- Honokiol
- NAD⁺ (nicotinamide adenine dinucleotide)
- Vitamins B1, B2, B6, and B12
- L-theanine
- Phosphatidylserine
- Gingko
- Botanical/POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic)

- Phosphatidylcholine
- Liposomal glutathione

Diet

Low Glycemic Anti-Inflammatory Diet

Alzheimer's is sometimes called "Type 3 Diabetes" because of its link to unhealthy glucose metabolism. A diet that's low in glucose (including natural forms of glucose) and low in foods that spike glucose and insulin is critical to reduce damaging glucose spikes that impact neurological function. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

IMMUNE SUPPORT AND INFECTIONS

Integrative protocols and strategies for supporting general immune function against pathogens and cancer enhance the function of the immune system and reduce immune evasion. They also include compounds that help attack pathogens.

In the treatment of infections, natural therapies specific to the infectious agent are incorporated into general immune support protocols. For example, selective compounds effective against Lyme disease and other related pathogens are often combined with general immune support agents into a comprehensive protocol.

In the case of autoimmune conditions, therapeutic goals include regulating inflammatory cascades and balancing the immune response.

Supplements and Formulas

Direct Immune Support

- Modified Citrus Pectin: 7.5 grams, 2 times/day
- Astragalus
- Botanically Enhanced Medicinal Mushroom Formula (MycoPhyto)
- Tibetan Herbal Padma Formula
- Vitamin C
- Vitamin D3
- Curcumin
- Botanical/POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic)

Autoimmune Balancing Support

- Modified Citrus Pectin
- Botanically Enhanced Medicinal Mushroom Formula
- Omega 3-6-9
- Quercetin
- Tibetan Herbal Padma Formula

INFECTIONS: LYME DISEASE

In *chronic* Lyme disease, antibiotics can make a patient worse. A multitiered approach is recommended to expose the Lyme pathogen from hiding and target it with specific botanicals, while supporting the systems of

the body, with emphasis on the digestive, immune, and nervous systems. There are many antimicrobial botanicals that have been utilized for the treatment of Lyme disease and coinfections. Addressing parasitic infections—often using pharmaceuticals for this purpose—is important, with the right timing. However, for the purposes of this appendix, I will not go into the specific antimicrobial herbs in detail.

Supplements and Formulas

Primary Support–Galectin-3 Blockade

- Modified Citrus Pectin: 7.5 grams, 2 times/day

Anti-Lyme Agents

- Artemisinin
- Garlic
- Cat's claw bark
- Japanese knotweed root

Direct Immune Support

- Astragalus
- Botanically Enhanced Medicinal Mushroom Formula (MycoPhyto)
- Tibetan Herbal Padma Formula
- Vitamin C
- Vitamin D3

- Curcumin
- Botanical/POS (pectic oligosaccharide) Enhanced Probiotic Formula (ecoProbiotic)

Neurological Protection

- Honokiol
- DHA/EPA omega fatty acids

Diet

Low Glycemic Anti-Inflammatory Diet

Sugar intake directly reduces immune function and feeds pathogens and microbes in the body. A diet that's low in glucose (including natural forms of glucose) and low in foods that spike glucose and insulin is critical to reduce damaging glucose spikes that suppress immunity and allow infections to flourish. (The Glycemic Index Chart in Appendix C gives examples of numeric values for foods based on how much they raise blood glucose. The lower the number, the better.)

For more information, visit SurvivalParadox.com.

APPENDIX E

CLEANSING AND DETOX PROTOCOLS

Most of the world's traditional medical systems emphasize the importance of periodic, seasonal cleansing and detoxification—particularly during the fall and spring seasons.

Through decades of research and clinical practice, I've refined very gentle yet highly effective detoxification protocols that can be used any time of year by anyone seeking to lighten their toxic load. While these approaches are very safe, even for advanced conditions, please remember to consult with a healthcare practitioner for additional detoxification guidance if you are being treated for a serious condition.

IN-DEPTH DETOX FUNDAMENTALS

Core Strategies

The core elements of this program include researched *detoxification supplements and herbal formulas*, *detox diet recommendations*, and *supportive at-home detox therapies*. These elements are customizable and compatible with other detox programs and therapies, making it easy to create your own personal protocol based on your preferences and unique needs.

Length of Time

How long you engage in a detox program is an individual choice and can depend on different factors like toxic body burden and personal time

commitment. Ideally, an in-depth periodic cleanse consists of a ten-day program with a week on either side to gradually transition (eliminating particular food categories prior to the cleanse, and then transitioning to your postcleanse diet). However, gentle detox programs even as long as two to three months can also be very useful for people with elevated toxic body burden, increased toxin exposure, or life-threatening diseases.

In addition, there are a handful of *daily detox formulas* I recommend below that are ideal for ongoing protection against toxins. These formulas provide daily detox benefits while actively supporting healthy cells, tissues, and organs.

In my experience, gentle daily detox combined with periodic, intensive detox on a regular basis offers the greatest protection and support for long-term health.

Preparation

I suggest planning your cleanse for a week when you're able to have some personal time, if possible. Look through the food items and at-home therapies, and make a shopping list. And just as important, make a list of the things you wish to release that are no longer serving you—physically, mentally, emotionally, and psychospiritually.

Goals of Detox Supplements and Formulas

In my practice, I rely on a handful of targeted detoxification formulas that offer comprehensive support for the body's major detoxification systems and pathways. These research-based formulas remove toxins, enhance detox functions and provide comprehensive protection via multiple mechanisms which:

- Bind heavy metals and toxins in the circulation and digestion, allowing for safe removal through the urinary and GI tracts
- Encourage cells, tissues, and organs to release stored toxins
- Enhance the natural detox functions of the liver, kidneys, and other organs of elimination
- Balance and optimize the two phases of liver detoxification for complete toxin metabolism
- Prevent toxin reabsorption and redistribution to other parts of the body
- Protect and support microbiome health and diversity
- Provide antioxidant support against damaging free radicals

For information on the different stages of detoxification, see Chapter 14.

Periodic In-Depth Detox Formulas

These are the key formulas used during periodic in-depth detox programs. They can all be used at the same time.

Modified Citrus Pectin and Alginates Formula (PectaClear® Toxic Metal Cleanse)

This researched formula safely removes toxic metals like lead, mercury, and arsenic, as well as environmental toxins, from the circulation and digestion. It works by tightly binding toxins for safe elimination without disrupting essential minerals the way other chelators do. The MCP in this formula binds to toxins in the circulation, while the alginates bind to toxins in the GI tract and prevent reabsorption. Together, these powerful natural binders safely eliminate a broad range of toxins, including radioactive ions, from

the body.

Dosage: 3 capsules, twice daily on an empty stomach.

Total Body Detox Formula (ecoDetox® Total Body Detox)

This botanical-nutrient formula enhances the body's natural detox functions and supports optimal balance of the phase 1 and 2 liver detox stages. The formula encourages the release of toxins from tissues into the circulation and provides critical antioxidant support. It's recommended as a two-part system with PectaClear (above) for broad-spectrum detox support and protection. While ecoDetox supports toxin discharge and processing, PectaClear binds to circulating toxins for safe elimination from the body.

Dosage: 3 capsules, twice daily with food.

Fermented Herbal Probiotics with Prebiotic Nutrients (ecoProbiotic)

This liquid probiotic has been a game-changer in my practice, providing rapid relief and digestive support while enhancing beneficial bacterial populations and a healthy GI environment. Effective microbiome support is critical during detox to protect beneficial microbes against circulating toxins and support optimal digestive renewal.

Dosage: 2–3 Tbsp, twice daily in water, away from food.

Organic Mushroom Formula (Ten Mushroom Formula®)

Medicinal mushrooms act like sponges and are excellent allies for detoxification. They work to absorb waste while delivering powerful nutrients to tissues impacted by toxic burden. In my practice, I recommend a blend of ten organically grown mushrooms that provide broad-spectrum detoxification and nourishment, with benefits for immunity, digestion, circulation, metabolism, and other areas.

Dosage: 4 capsules, twice daily.

Everyday Detox Support and Protection Formulas

Toxin exposure is an everyday issue. In addition to periodic, in-depth detoxification, gentle daily support can help prevent dangerous toxins from accumulating in the body while protecting vulnerable organs and tissues against ongoing exposure.

Modified Citrus Pectin (PectaSol®)

For everyday detox, protection, and optimal cellular and organ support, my top recommendation is the researched form of Modified Citrus Pectin because of its broad range of cellular and total-body benefits. It also gently binds and removes toxins from the circulation for safe elimination.

Dosage: For daily maintenance against toxins—5 grams, daily, on an empty stomach.

For intensive cellular and organ support—15 grams, daily, in 2–3 divided doses, on an empty stomach.

Pesticide Detox Formula (GlyphoCleanse®)

In today's environment, eating organic isn't enough to protect against exposure to pesticides, like the toxic weed killer glyphosate. We're constantly exposed to pesticides through our foods, products, air, water, and surrounding environments. For daily support and protection, I recommend a targeted pesticide detox formula containing natural binders that help remove pesticides and agricultural/environmental chemicals, and protect vulnerable organs and tissues, like the thyroid.

Dosage: 3 capsules, once or twice daily, away from food.

Fermented Organic Herbal Probiotics with Prebiotic Nutrients

(ecoProbiotic)

This liquid probiotic has been a game-changer in my practice, providing rapid relief and digestive support while supporting beneficial bacterial populations and a healthy GI terrain.

Dosage: 2–3 Tbsp, twice daily in water, away from food.

Detox Diet and Foods

The goals of a detox diet are multifold:

- Help remove heavy metals, pesticides, and chemical and microbial toxins
- Eliminate foods that have strong proinflammatory potential
- Rest your digestive system from the difficulty of digesting concentrated proteins, fats, and nutritionally depleted foods such as sugar, refined flour products, etc.
- Alkalinize your system, promoting oxygenation and release of toxins
- Provide energy for your organs of elimination
- Provide nutrients to deeply revitalize at the cellular level
- Repopulate the GI tract with beneficial bacteria
- Improve digestion and nutrient assimilation
- Improve bowel transit time
- Heal and minimize intestinal permeability
- Improve immune function

- Balance hormones

A note about organic: When selecting foods for your cleanse program, it's important to choose organic whenever possible to reduce toxin exposure and help keep your detoxification pathways clear. Some studies even suggest that switching to organic foods allows the body to begin eliminating pesticides and environmental toxins that have been stored in tissues.

Foods to Emphasize During Detox

Vegetables

- Green leafy vegetables, especially bitter greens: dandelion greens, endive, parsley, beet, kale, chard, mustard greens, bok choy, arugula, mixed salad greens
- Cruciferous vegetables: kale, broccoli, broccoli sprouts, cauliflower, Brussels sprouts
- Onion family: onions, shallots, garlic, leeks
- Artichokes and Jerusalem artichokes
- Other vegetables: beets, celery, asparagus, zucchini, cucumbers, string beans, naturally fermented sauerkraut, sea vegetables

Preparation: Raw, juiced, or steamed/boiled, baked, water sautéed.

Vegetable Juices

Vegetable juices are alkaline rich, mineral rich, and phytonutrient rich. When tissues hold waste or are damaged by free radicals, they become acidic. Vegetable juices and broths provide an alkaline reserve that mineralizes and alters tissue pH, allowing cells and tissues to rid themselves

of metabolic waste and toxins.

Fresh juice made from leafy greens as a basis is ideal for detox. For example, kale/parsley/celery/beet, or kale/cucumber/parsley/cilantro/carrot, or kale/parsley/celery/apple. Add fresh ginger or garlic for additional benefit. Wheat grass juice and barley grass juice are also excellent, as are powdered juice concentrates for convenience. Veggie juices should be taken two to three times per day if possible.

Fruits

In order to keep blood sugar levels stable during detox, only certain fruits are recommended during a cleanse, and in small amounts. These include apples, pears, peaches, citrus (eaten separately), blueberries, and raspberries. Avoid other fruits during detox. It is best to avoid fruits altogether during a cleanse.

Hydration

Drink a minimum of eight 8-oz. glasses of filtered water per day. Add lemon to your water as desired for extra detoxification effect. Herbal detox teas are also excellent.

Herbal teas

Noncaffeinated herbal tea helps you stay hydrated and supports your detox process. A variety of commercially available detox teas are available, or you can make your own using any combination of the following: dandelion root, burdock root, astragalus root, ginger root, licorice root, nettle, cleavers, mint, horsetail, oatstraw, fennel, cardamom. Simmer roots for fifteen minutes, then add more delicate herbs and let steep for ten minutes.

Protein

During detox, an organic rice-based or seed-based protein powder (like hemp seed) several times per day can help keep your blood sugar levels stable. Sprouted seeds (sunflower, pumpkin, sesame) and sprouted beans (like mung beans) are rich in enzymes and protein to support optimal detoxification and nourishment.

Carbohydrates

Organic brown basmati rice, quinoa, amaranth, and millet are good sources of carbohydrates to sustain your energy throughout the cleanse.

Alkalinizing Broth

Simmer the following vegetables for forty-five minutes: celery, green beans, zucchini, parsley, spinach. Strain and drink the broth throughout the day. You can also puree the vegetables after cooking and consume as a thicker soup. Can keep refrigerated for three days.

Mineral Broth

Make as above with the addition of any of the following: beets, kale, mustard or dandelion greens, seaweed, flax seed, nettle, astragalus root, burdock root, turmeric root, garlic, onion.

Herbs and Condiments

Ginger, cayenne, dandelion, licorice, burdock root, milk thistle, dandelion root, curry, turmeric, nutmeg, and cinnamon may be added liberally to your dishes for variety and for their benefits on digestion and detoxification.

Oils

Up to 2 Tbsp per day of olive oil coconut oil, or flax seed oil (unheated).

Fiber and Elimination

It's important to aim for at least two bowel movements per day during detox, and you may find you need some assistance with this. The high-fiber content of the vegetables may be adequate, but if not, consider adding a fiber source to your program. Fresh-ground flax seed, rice bran, or psyllium husk can be used to assist your bowels in emptying regularly. Otherwise, toxins may get reabsorbed into your system.

Foods to Avoid

These foods are known to cause inflammation and can hinder digestion and elimination, while increasing toxic body burden. Avoiding them during a cleanse can help to reset your digestion and allow for more effective and efficient detoxification process.

- Meat, fish, poultry, eggs
- Dairy products
- Gluten containing grains: wheat, rye, oats, barley
- Corn and all products containing corn
- Sugar, honey, molasses, artificial sweeteners
- Table salt
- Fruit juices (eat only whole fruits—see above list)
- Cold drinks
- Cooked oils
- Any raw fats or oils aside from a small amount of olive, coconut oil, or flax oil
- Alcohol

- Black tea
- Coffee
- Ketchup, mayonnaise, barbeque sauce, relishes, commercial salad dressings or marinades
- Chocolate
- Soy

SUPPORTIVE DETOX THERAPIES AND ACTIVITIES

In detoxification, the goal is to provide multifaceted support to the organs of elimination, including the liver, bowels, lymph, skin, lungs, and kidneys. We also want to support the release of deeper emotions, stress, and mental patterns that may no longer serve us.

The following therapies and practices can help relieve stress and blockages, and support a more holistic and complete detox experience that encompasses all aspects of your being:

- Dry brush lymphatic massage
- Hot and cold alternating shower
- Baking soda/sea salt/Epsom salt baths
- Minitrampoline rebounding exercise
- Jumping rope
- Light aerobic exercise
- Self-massage with sesame oil and essential oils
- Massage/energetic healing

- Acupuncture
- Steam or sauna
- Meditation
- Breathing exercises
- Tai Chi
- Qigong
- Laughter/singing
- Journal writing (What do you want to release in all areas of your life?)
- Considering how you can turn your life more toward releasing than holding on
- Spending time in nature
- Giving away things you don't need

Lemon and Olive Oil Drink

This simple yet powerful detox drink helps to support the detox functions of the liver and gallbladder, and stimulates bile flow. It's a staple in many of the detox programs I recommend, and oftentimes, patients report that it helps them sleep better. It should not be ingested if you have gallstones.

The optimal time to take this drink is right before bed (but you can also ingest it early in the morning when you wake up). It can be done during a 2–3 week detox program or ongoing as a daily detox. It's best to drink during the spring and fall as part of a seasonal cleanse.

Ingredients:

- 1 organic lemon
- 1 Tbsp organic extra-virgin olive oil
- 1¼ cups water (10 oz.)

Directions:

- Cut the ends off the lemons. Cut into quarters and take the seeds out.
- Put lemon, olive oil, and water into a blender (usually makes 3 drink servings per blender).
- Blend until as smooth as possible. You can strain off and discard the pulp or drink without straining (my personal preference).

The first night, you may start with ¾ lemon, then use one whole lemon the next night. Start with ½ Tbsp of organic olive oil and gradually increase to 1 Tbsp.

For more information, visit SurvivalParadox.com.

GAINING MOMENTUM

Whatever your health goals may be, the practice of gentle, safe detoxification using researched therapies and treatments can offer profound momentum and some of the most tangible results on your personal healing journey.

APPENDIX F

RADIATION EXPOSURE

IONIZING AND NONIONIZING RADIATION

There are several types of radiation, some of which are natural. For example, sunshine provides us with heat and light, and consists of infrared (IR), ultraviolet (UV), and visible radiation frequencies.

Ionizing radiation is another type of radiation of a higher frequency, consisting of X-rays and gamma rays. It's produced by unstable atoms giving off energy and is considered to be more of a health threat, as it can negatively affect the basic makeup of atoms in cells, specifically the DNA.

Nonionizing radiation is of a lower frequency, such as UV, IR, microwave (MW), radio frequency (RF), and extremely low frequency (ELF) radiation. It's considered harmful only to the extent of the heat energy it transfers. While UV light is natural, it can cause harmful effects similar to those of ionizing radiation and is associated with an increased risk of cancer.

RADIATION EXPOSURE

Today's frequent use of CT scans and nuclear medicine increases our exposure to radiation.⁸⁴ The dangers of radiation exposure include DNA oxidative damage, DNA breaks, chromosomal aberrations, oxidative damage to mitochondria, and cell membrane damage. The recommended limit for ionizing radiation in Europe for the public is one millisievert (mSv) per year.⁸⁵

Flight crews and frequent flyers are exposed to cosmic radiation at high elevations; therefore, flight crews have higher recommended limits at six millisieverts per year. The exposure rate for flight crews is higher than that of any other worker group, including industrial, governmental, medical, and nuclear power workers.

The following list will give you an idea of the average effective exposure in common medical procedures, and while flying:

- Full dental X-ray: 0.01 mSv
- Chest X-ray: 0.1 mSv
- Mammogram: 0.4–0.6 mSv
- Head CT scan: 2 mSv
- Nuclear imaging bone scan: 6.3 mSv
- Chest CT scan: 7 mSv
- Colonoscopy CT: 10 mSv
- Round-trip transatlantic flight: 0.1 mSv

ANTIOXIDANTS AND FREE RADICALS

Just as building a fire produces smoke, energy production by the mitochondria, as well as exposure to different radiation, produces by-products called free radicals. Antioxidants neutralize these free radicals, but if there aren't enough antioxidants in the body, or if the body doesn't utilize them efficiently, free radicals will cause damage. As we age, there is an increase in mitochondrial dysfunction, resulting in the production of more free radicals. We revert to less-efficient energy production pathways that can

produce additional intracellular toxic by-products.

We need to help and support the body in the clearance of free radicals by including foods high in antioxidants, such as fruit and vegetables, and through dietary supplementation with antioxidant botanicals and nutrients. Detoxification can also provide essential support for the body's antioxidant systems.

ACKNOWLEDGMENTS

This book has been in the making for a long time, and it never would have happened without the help of many people. Special thanks to Ruby Tischoff for supporting me in the long and tedious writing and editing process—this book would not have happened without you. To Barry Wilk and Elaine Weil, who provided technical and research support. To Logan Wroolie, who converted boring scientific diagrams into clear illustrations that anyone can understand. To Anat Stern, who made sure that nothing was missing. To my daughter Lihi Eliaz, who revised and rewrote the book and truly transformed the manuscript, I can't thank you enough. Your wisdom, love, and kindness permeated this book. My gratitude to all the other staff members who reviewed the book and provided constructive comments.

Special thanks to Kacy Wren, who supervised the book production process. It sure wasn't easy! You are amazing! To Jane Borden for the final editing and for believing in the book, your skill and care is invaluable. To Rachael Brandenburg and Derek George for the book cover. To Cristina Ricci, Ian Claudius, and Aleks Mendel. Thanks to the entire team at Scribe, who accommodated many changes and revisions (including a whole redo). You were always there with patience and supportive advice.

ABOUT THE AUTHOR

Isaac Eliaz, MD, MS, LAc, has been a pioneer in the field of integrative medicine since the early 1980s, with a focus on cancer, immune health, detoxification, and mind-body medicine. He is a respected clinician, researcher, formulator, author and educator, and a lifelong student and practitioner of Buddhist meditation.

Dr. Eliaz's unique, holistic approach to health and healing is informed by his extensive background in Western medicine and translational research, traditional Eastern medicine, and complementary modalities. In 2001, he founded Amitabha Medical Clinic in Santa Rosa, California, where patients come from around the world to receive leading-edge, patient-centered treatment. His nonprofit organization, Amitabha Wellness Foundation, sponsors low-cost and no-cost health education and care.

As part of his commitment to the advancement of integrative medicine, Dr. Eliaz partners with renowned research institutes and has coauthored numerous peer-reviewed papers. Many of his innovative protocols and treatments have also been validated in peer-reviewed literature, and he regularly lectures at international medical conferences and scientific meetings on the use of these and other integrative therapies for cancer and chronic diseases.

As a lifelong student and practitioner of meditation and mind-body medicine, Dr. Eliaz also offers meditation and healing retreats to patients and practitioners around the world. These educational events are open to the public. To learn more about his research, treatments, formulas, and

workshops, visit SurvivalParadox.com, DrEliaz.org, AmitabhaClinic.com, Econugenics.com, AmitabhaWellnessFoundation.org, and Amitabha.co.il.

⁸³ Fiona S. Atkinson, Kaye Foster-Powell, and Jennie C. Brand-Miller, “International Tables of Glycemic Index and Glycemic Load Values: 2008,” *Diabetes Care* 31, no.12 (2008): 2281-2283, <https://doi.org/10.2337/dc08-1239>.

⁸⁴ Fred A. Mettler, Walter Huda, Terry T. Yoshizumi, and Mahadevappa Mahesh, “Effective Doses in Radiology and Diagnostic Nuclear Medicine: A Catalog,” *Radiology* 248, no. 1 (2008): 254–63, <https://doi.org/10.1148/radiol.2481071451>.

⁸⁵ National Council on Radiation Protection and Measurements, *NCRP Report 160*, June 1, 2015, <https://ncrponline.org/publications/reports/ncrp-report-160-2/>.